ENGINEERING NEWS-RECORD

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They paved pipe for extra wear

The invert in all types of drainage structures is the part that generally gets the most wear. To Armco engineers this meant reduced service life and lowered efficiency.

They reasoned that if they could make the invert of Armco Corrugated Metal Pipe last as long as the upper part, everyone would benefit.

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PAVED-INVERT is only one of many Armco Drainage and Construction Products developed to meet specific needs. There is Armco Pipe-Arch, designed to provide drainage under limited headroom. Armco ASBESTOS-BONDED assures ample material durability for extremely corrosive conditions. For water and gas lines, as well as foundation piling, Armco engineers perfected automatic machines that would turn out steel pipe in lengths up to 50 feet and more in a wide range of sizes. Automatic machines also produce economical Armco HEL-COR Pipe that is widely used for pile shells and in subdrainage systems. The list of other Armco-developed products includes steel buildings, re-usable steel sheeting, bin-type retaining walls, and corrugated metal bridge plank.

Today you can bring your drainage and construction problems to Armco with full assurance that you will receive all the benefits of long experience, extensive research and a real interest in helping you solve them.

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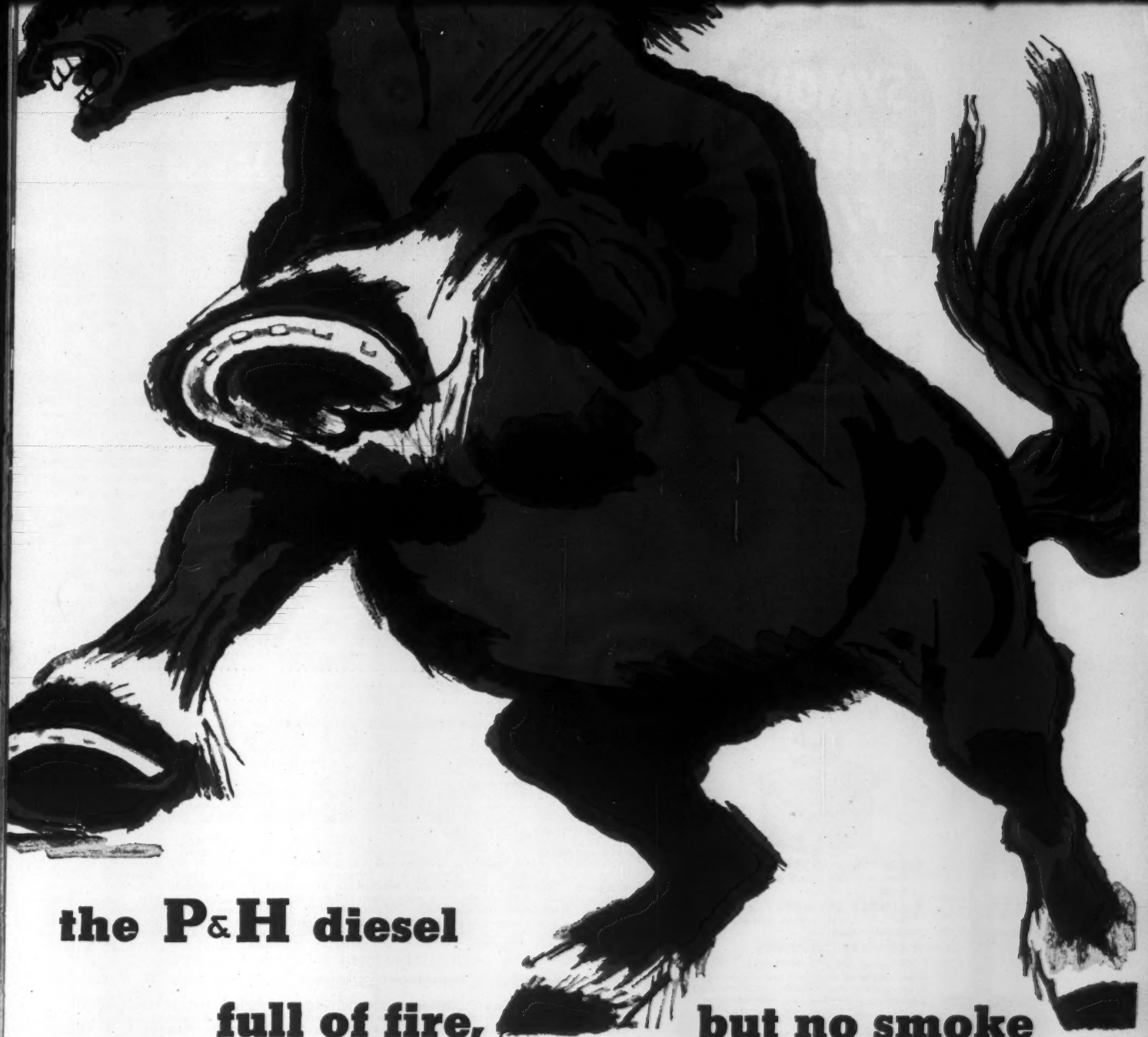
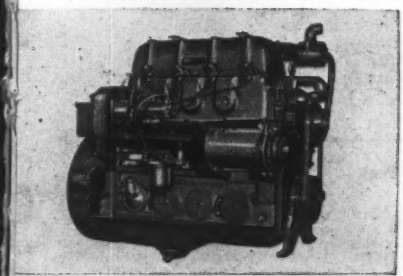


the P&H diesel

full of fire, but no smoke



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Quite an engine, this P&H Diesel . . . we'll be glad to send you the whole story. Write: P&H Diesel Engine Division, Harnischfeger Corporation, Crystal Lake, Ill.

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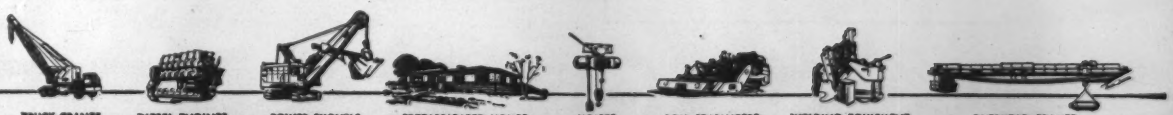

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Publisher

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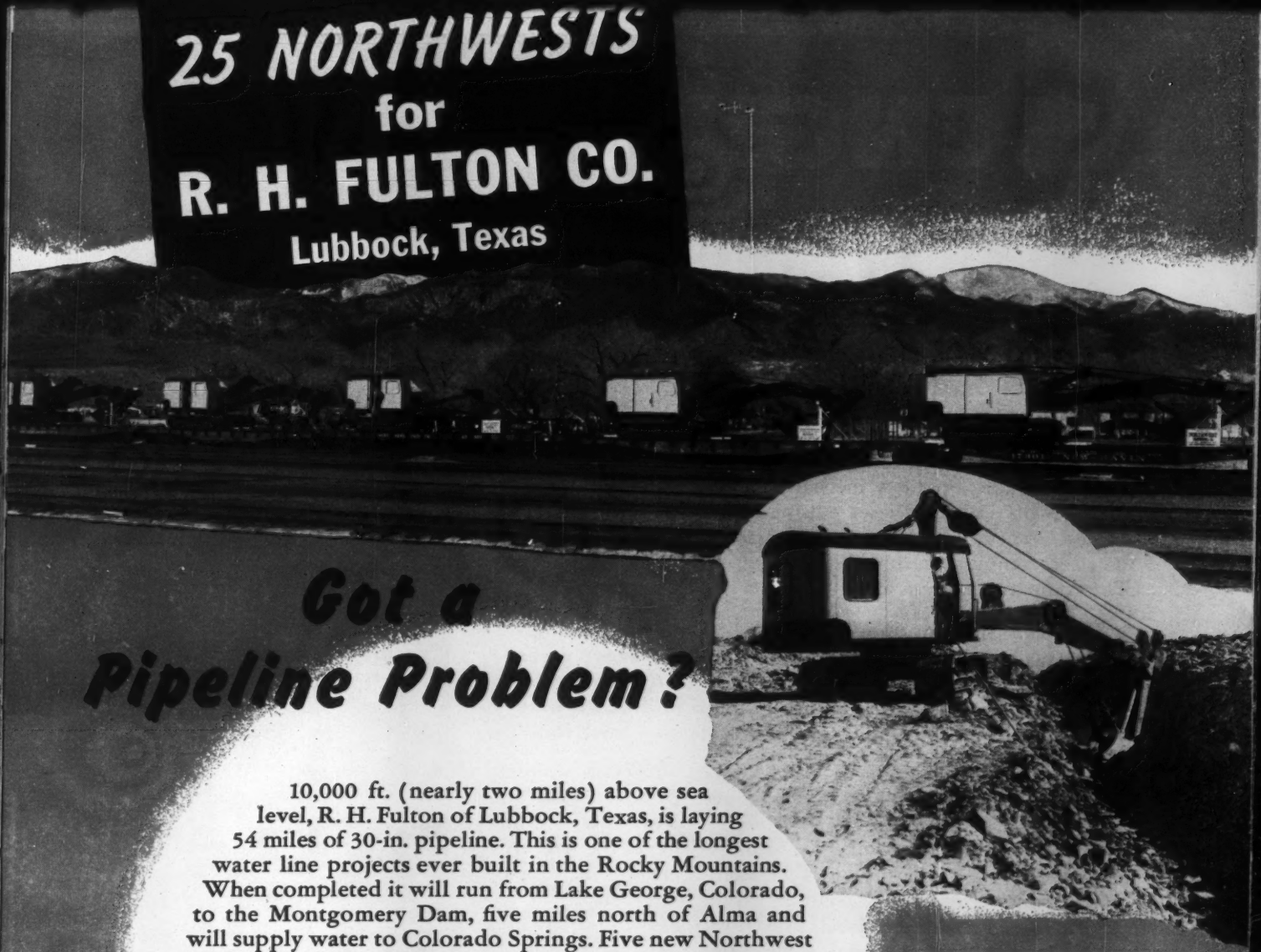
25 NORTHWESTS for R. H. FULTON CO.

Lubbock, Texas



Got a Pipeline Problem?

10,000 ft. (nearly two miles) above sea level, R. H. Fulton of Lubbock, Texas, is laying 54 miles of 30-in. pipeline. This is one of the longest water line projects ever built in the Rocky Mountains. When completed it will run from Lake George, Colorado, to the Montgomery Dam, five miles north of Alma and will supply water to Colorado Springs. Five new Northwest Model 41's, four pullshovels and one crane, recently arrived for the job. These five Northwests make 25 Northwests that have been purchased by the Fulton organization.

From desert to high altitudes, R. H. Fulton & Co. have proved Northwest equipment and know that it is the solution to their problem.

Take a leaf from the men who know. Remember, one out of every three Northwests sold is a repeat order. You may not have mountain work to do but *you do want* dependability. Northwest has it for you! Ask for more complete details.

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Chicago 3, Illinois

Top: Five Northwests arriving at Colorado Springs for R. H. Fulton Co.

Below: Look at that digging! One of the many tough pipeline jobs on which Northwests have proved their reliability both for digging and for travel.

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ENGINES CLEAN, UPKEEP COSTS

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Isbell relies on the famous *Texaco Ursa Oil* series — a complete line of lubricating oils especially refined to make diesel and heavy duty gasoline engines give *more power* with *less fuel* over *longer periods* between overhauls. Whatever the size, type and speed of *your* engines, or fuel used, there is a member of this famous series exactly right to assure these benefits.

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For wheel bearings, Isbell uses *Texaco Marfak Heavy Duty* — it protects against dirt and moisture, seals itself in, assures safer braking. No seasonal change required.

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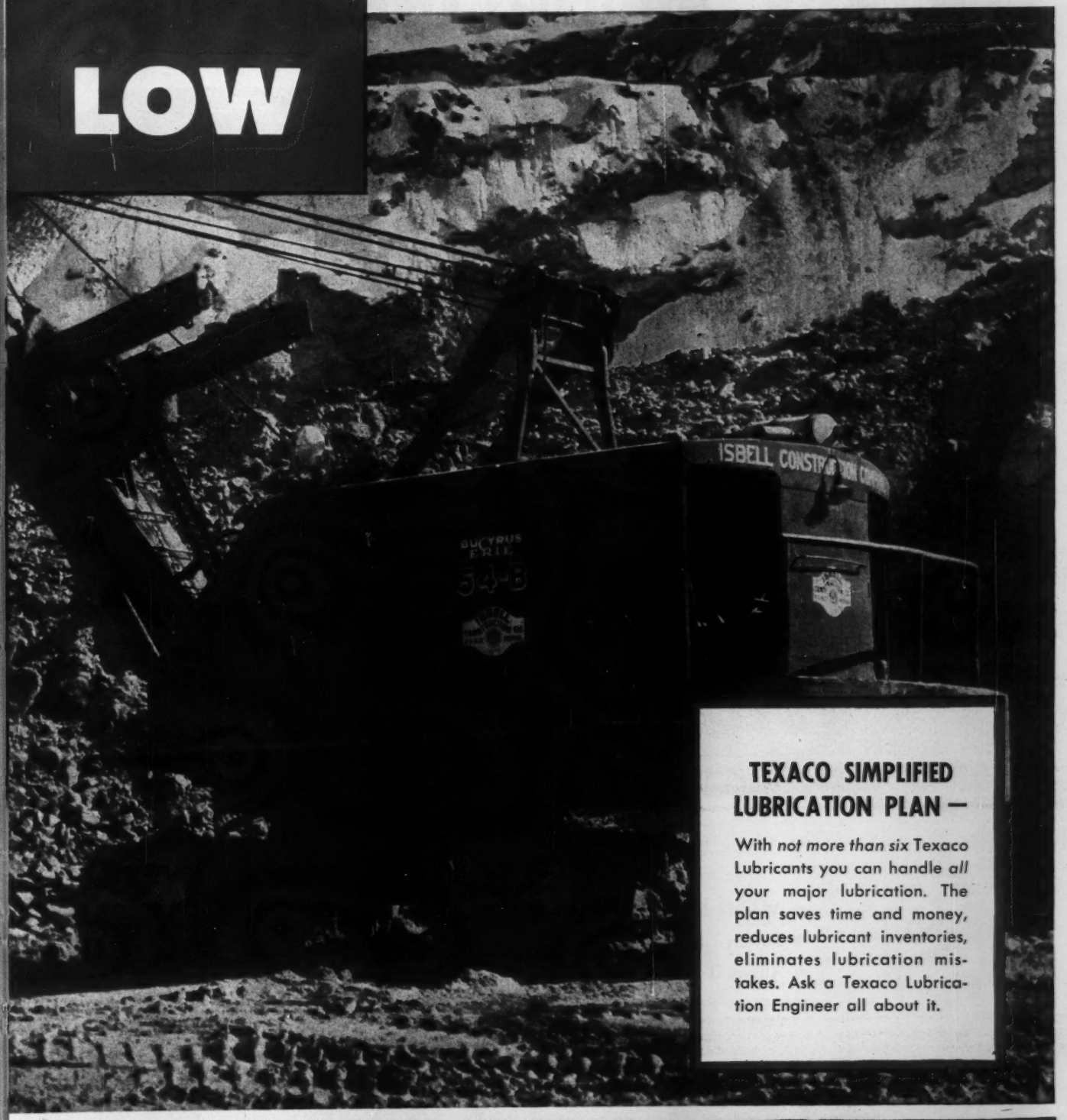

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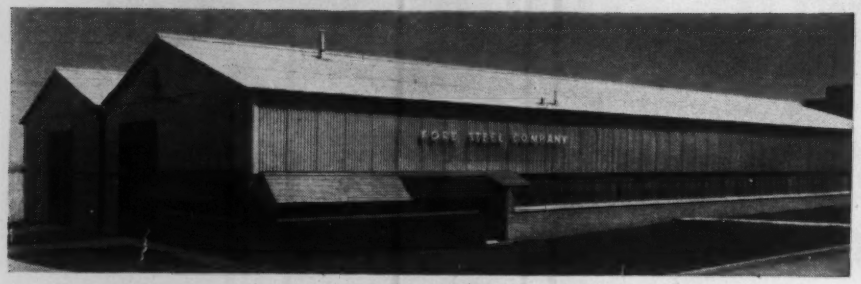
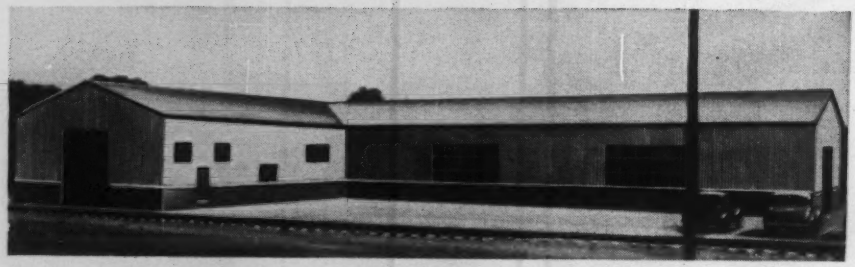


AND LOWER BUILDING COSTS...



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READER COMMENT

Against Waterway Partnership

SIR: I was very much interested in the in the Feb. 10 issue of ENGINEERING NEWS-RECORD, which contains on p. 112 an editorial entitled "Partnership" on Waterways. Our committee has a direct interest in the Delaware River case which is cited in the editorial, and I should like to take this opportunity to set forth our thinking regarding the improvement of the Delaware River.

Historically and statistically, we can relate commercial and industrial well-being to the existence of truly navigable waterways. The Army Engineers, in a report on the lower Delaware River, have stated that for safe and efficient navigation we should have 40 ft of water to accommodate a vessel with a draft of 30 ft. This premise of the Army Engineers has been accepted as factual and realistic, and because of the fact that a 30-ft draft vessel is very average in today's experience, it is logical and proper that we should provide the water depth necessary to accommodate such an average type vessel. A survey by the National Federation of American Shipping reveals that about 96% of privately owned American ocean-going vessels are unable to use a 25-ft waterway. The Maritime Administration recently proposed a number of new ship designs to replace units now in operation in the United States Merchant Marine. Most of the new designs will require a 40-ft channel in the Delaware River. Economy and efficiency have brought about the larger, deeper draft, modern cargo carrier; and the Delaware River Port, in order to remain competitive, must be in a position to accommodate these modern vessels. Other ports (such as Boston, New York, Norfolk, New Orleans, and San Francisco) have 40-ft depths. The Delaware River is an international highway; and, therefore, we must look beyond our own shores to see what foreign ports have. There we find more than 50 ports in foreign countries the world over with minimum depths of 40 ft.

The improvement and development of our navigable waterways, such as the Delaware River, have always been the responsibility of the federal government, and we are opposed to the suggested sharing of costs by local interests as it is neither equitable nor practical. The Delaware is an established highway of ocean commerce and it is open to all who care to use it. Contributions in the form of a

A SPACE STATION . . . a thousand miles high in the stratosphere slowly circling the globe . . . observers near its rim studying cloud formations and the earth's atmospheric conditions below . . . this may be our weather bureau of the future.

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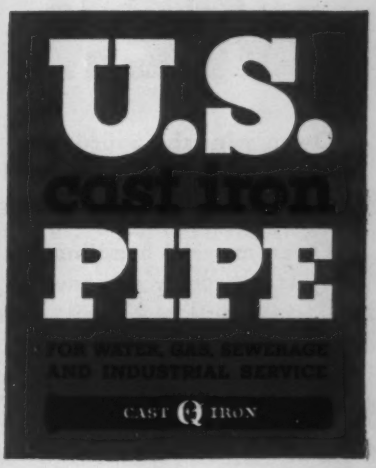

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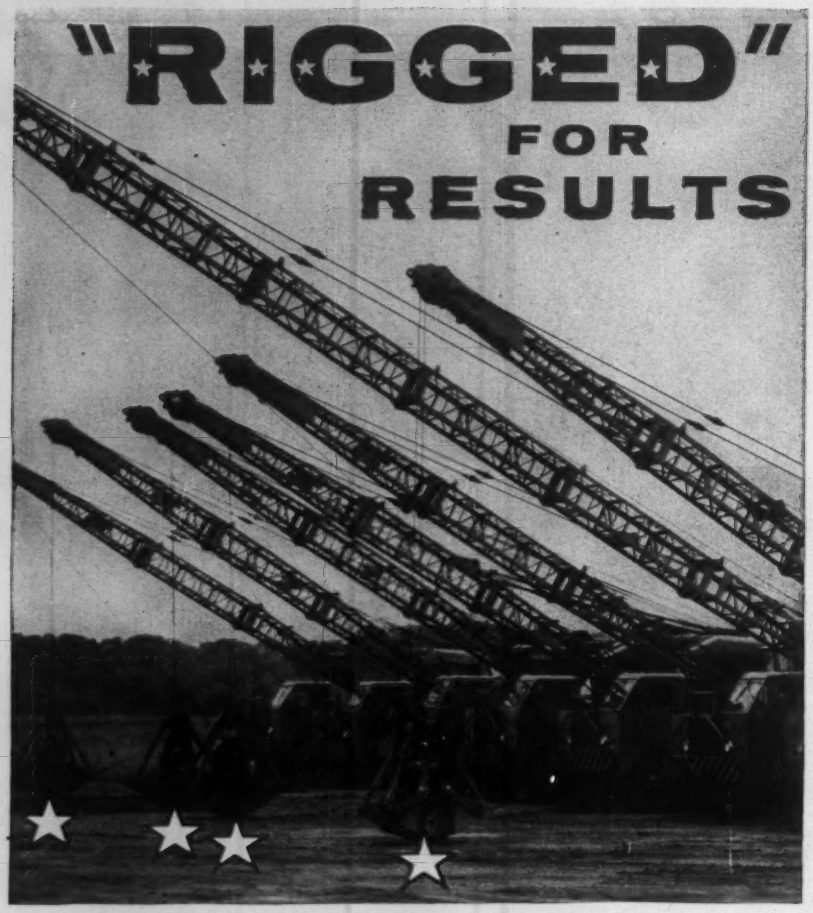

This impressive fleet of Byers Truck Cranes is lined up to start a Walsh-Perini-Groves-Slattery Co. construction job for the United States Steel Fairless Plant at Morrisville, Penna.

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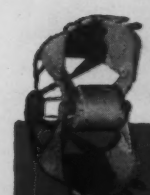

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READER COMMENT

capital investment or in the form of tolls cannot be placed upon this section of the Delaware River unless similar treatment is devised for all other navigable streams throughout the nation—to do otherwise would create sponsored penalty against this area. Contributions, no matter what form they might take or by whom they might be made, could not possibly be recouped. Only the federal government can recoup the cost of channel improvements through the federal tax structure.

In authorizing this channel improvement, the Congress turned down the specific request of the Bureau of the Budget that the local interests should be required to contribute to the cost of the project. It is most unfortunate as well as improper that the issue should again be raised. This committee is adamantly opposed to the partnership principle as it has been proposed for navigable waterways such as the Delaware River. Your editorial expresses the feeling that the theory behind the Administration's proposal is sound and that a form of regional partnership would be a suitable answer to the problem. We believe that the facts remove the project from one of a regional nature and establish it as one of national application.

HARRY G. SCHAD, *Chairman*
Joint Executive Committee for the Improvement and Development of the Philadelphia Port Area
Philadelphia, Pa.

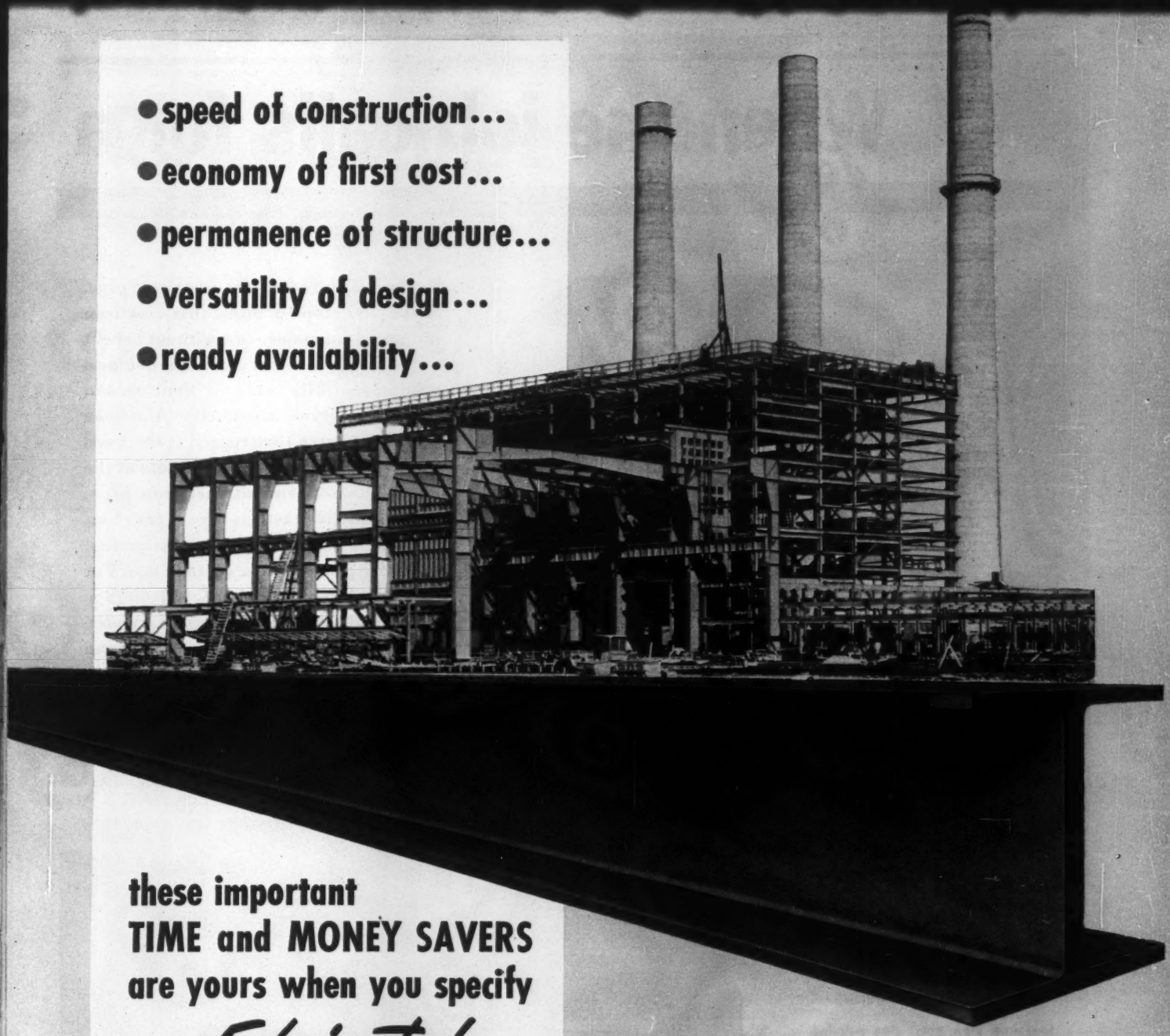
Bigger Pile-Load?

SIR: In your article "H-Pile Resists 450-Ton Load," (ENR February 24, 1955) we note the statement, "This is believed to be the heaviest load ever imposed on an H-pile and might be the biggest weight ever placed on a single pile." May we call to your attention a pile test performed in Chicago, Illinois, on February 17, 1954, by the Armour Research Foundation. The test was part of a research program sponsored by the United States Steel Corporation. A 14-in. 117 lb. H-Beam pile was tested in accordance with the Chicago Building Code which requires that the test load be maintained until no measurable settlement is observed in a period of sixteen hours.

The pile was driven to bearing on rock, a total depth of 104-feet. A net settlement of 0.038-in. was recorded after the test load of 400 tons was removed. The total deflection during the test was 0.695-in. After the pile

(*Continued on page 14*)

- speed of construction...
- economy of first cost...
- permanence of structure...
- versatility of design...
- ready availability...



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Cast iron pipe water line installed in front of Marshall Field's in Chicago during subway construction.

Installing mechanical joint cast iron pipe to carry mine water for an Alabama Coal Company.

Rugged *is* the word for cast iron pipe. When you stop to think that cast iron water and gas mains—cast without benefit of modern metallurgical science and production skills — are in their *second century* of service in over sixty American cities, you agree that rugged *is* the word for cast iron pipe. Then, take note of the fact that *modernized* cast iron pipe, centrifugally cast, is even tougher, stronger and more uniform in quality, than the product of a century ago. For further information, write Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3.

CAST Q IRON

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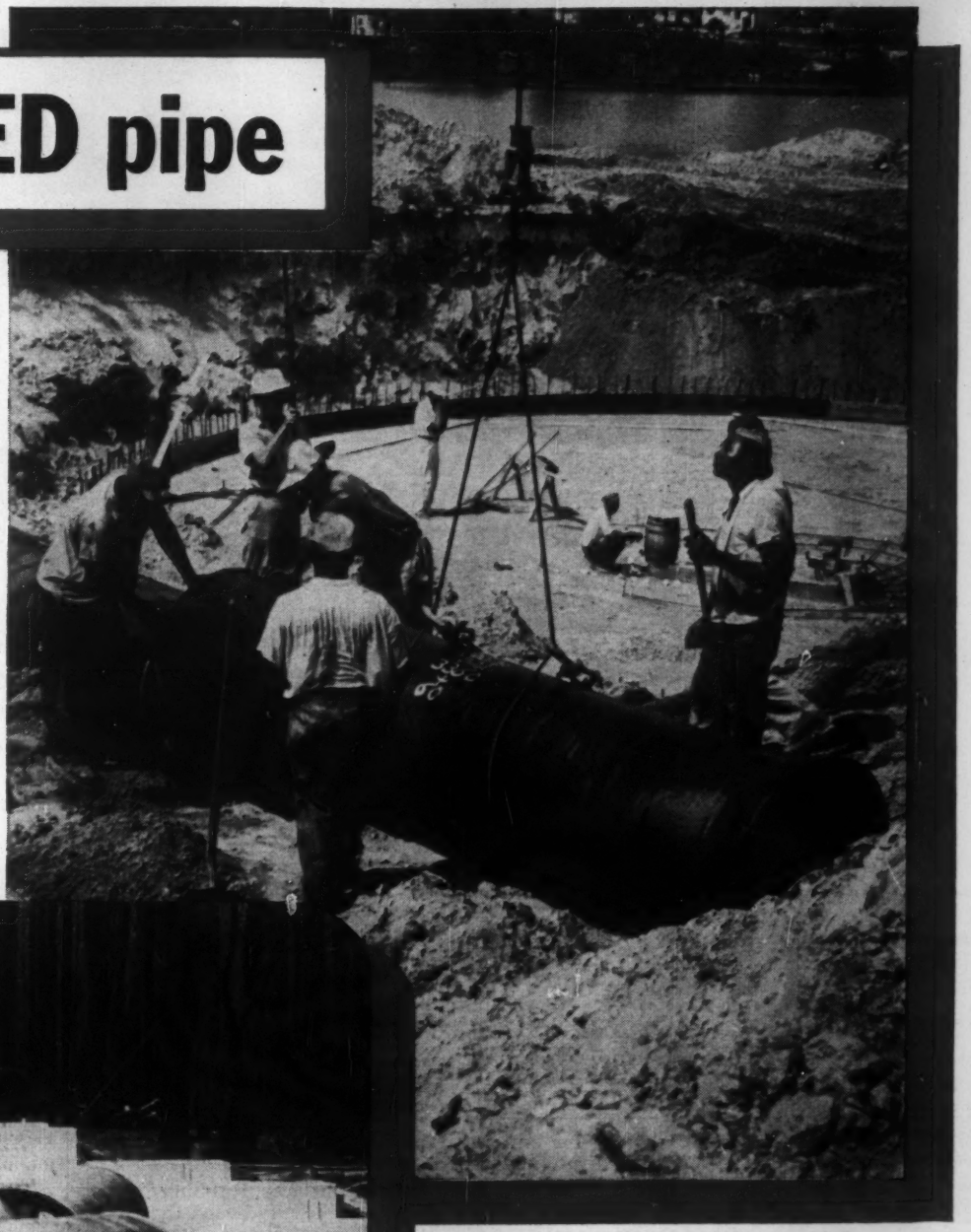
24-inch mechanical joint cast iron pipe for gas supply line at Skokie, Ill.

CAST IRON PIPE

RUGGED pipe



Laying 30-inch cast iron pipe for sewage treatment plant at Panama City, Florida.

Cast iron pipe line on piers to maintain grade from sewage treatment plant to outfall—at Durham, N. C.

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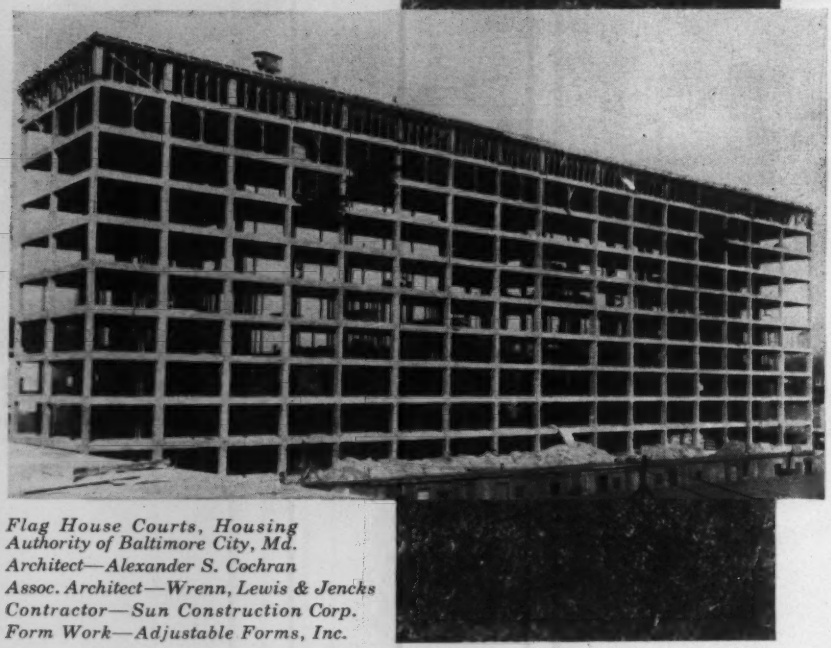

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READER COMMENT

had successfully passed the standard load test it was loaded until failure occurred. The maximum load sustained by the pile was 635 tons. The mode of failure was a general plastic yielding of the steel. The net deflection after removal of the load was 1.493″. The total deflection observed during the test to failure was 2.669 in.

The test load was applied to the pile by 2-500-ton hydraulic jacks mounted on brackets attached to the pile. The thrust of the jacks was resisted by a framework of beams bolted to eight anchor piles.

In addition to the pile mentioned above, eight H-beam piles of various sizes and lengths were tested to obtain load-deflection data. It is expected that the results of these tests will be made available to the profession by the United States Steel Corporation in the near future.

EUGENE GUILLARD
Research Engineer
Armour Research Foundation
Chicago

CALENDAR

Rail Steel Bar Association, annual meeting, Grand Hotel, Point Clear, Ala., April 27-29.
Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Los Angeles, Calif., April 27-29.
Society of American Military Engineers, annual meeting, Waldorf-Astoria Hotel, New York, N. Y., May 5-6.
Annual Conference for Engineers and Architects, Ohio State University, May 6.
Purdue Industrial Waste Conference, Purdue Memorial Union, May 9-11.
Heating, Piping and Air Conditioning Contractors National Association, annual convention, Shamrock Hotel, Houston, Texas, May 10-13.
Engineering Institute of Canada, annual meeting, Royal York Hotel, Toronto, Ont., May 11-13.
Michigan State College Centennial, engineering symposium on the application of automation to building design and construction, East Lansing, Mich., May 12-13.
New York State Society of Professional Engineers, annual convention and engineering industries exposition, Commodore Hotel, New York City, May 12-14.
National Materials Handling Exposition, International Amphitheatre, Chicago, May 16-20.
Structural Engineering Conference, University of Missouri, Columbia, Mo., May 20-21.
Air Pollution Control Association, annual meeting, Detroit, Mich., May 22-26.
National Rivers and Harbors Congress, national convention, Mayflower Hotel, Washington, D. C., May 30-June 1.
National Society of Professional Engineers, annual meeting, Bellevue-Stratford Hotel, Philadelphia, June 2-4.
American Water Works Association, convention, Conrad Hilton Hotel, Chicago, June 12-17.
The American Institute of Architects, annual convention, Hotel Radisson, Minneapolis, Minn., June 20-24.
American Society for Engineering Education, annual meeting, Pennsylvania State University, State College, Pa., June 20-24.

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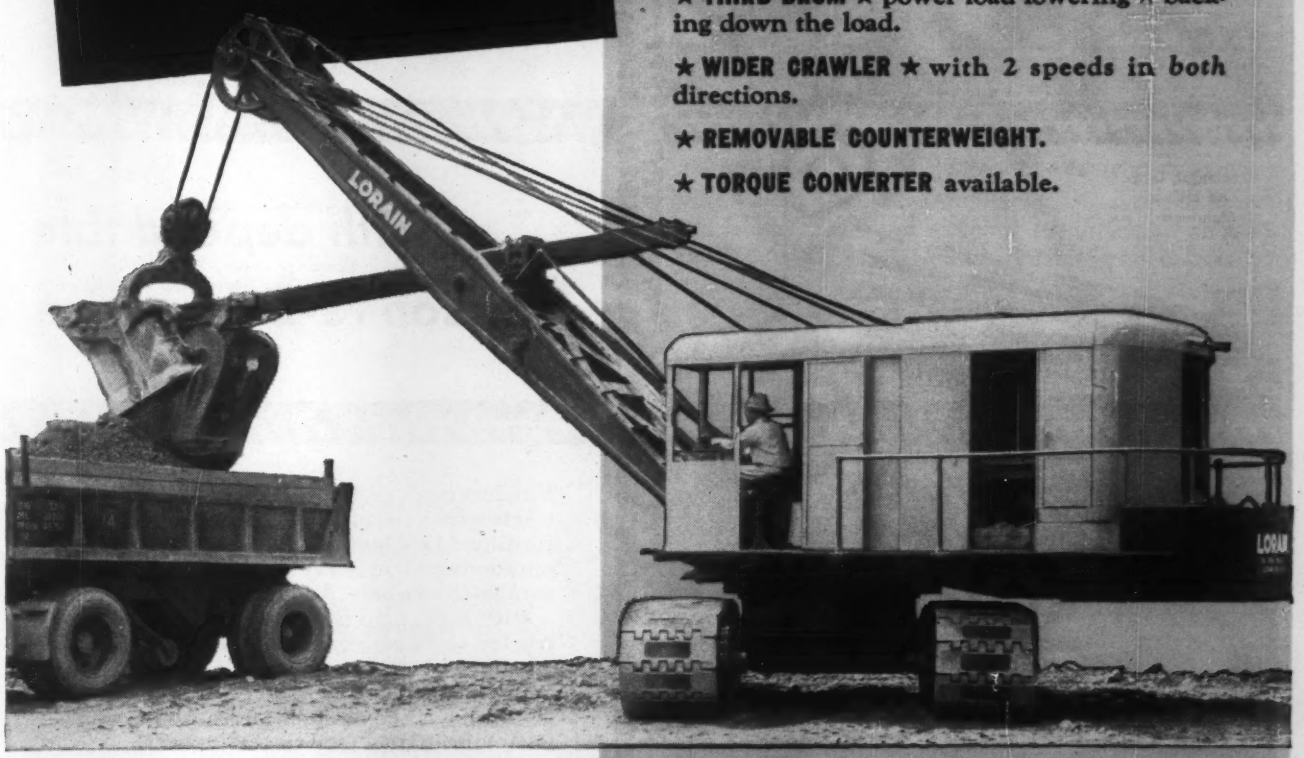

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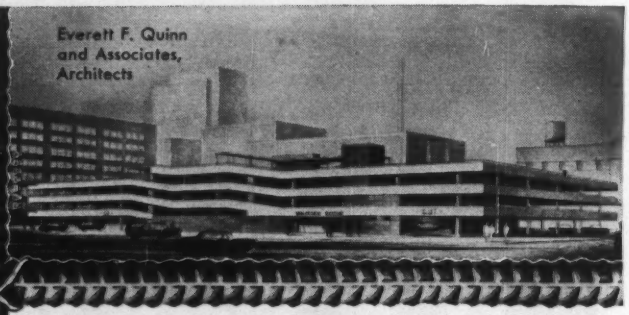
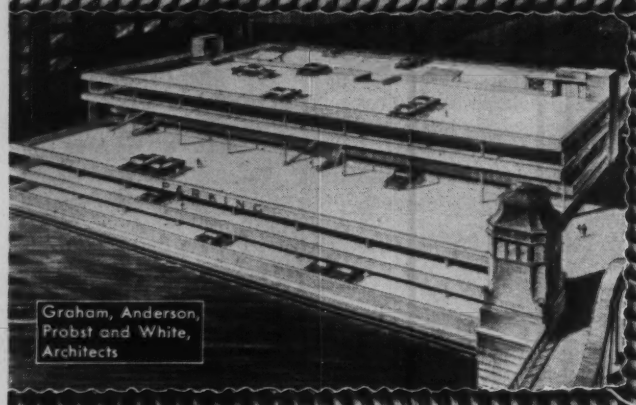
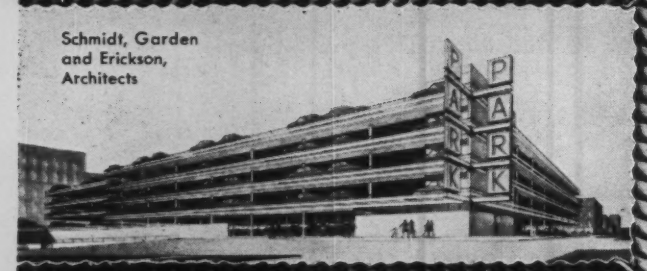

Everett F. Quinn and Associates, Architects


Graham, Anderson, Probst and White, Architects

Contractor Beats Bonus Schedules


Schmidt, Garden and Erickson, Architects

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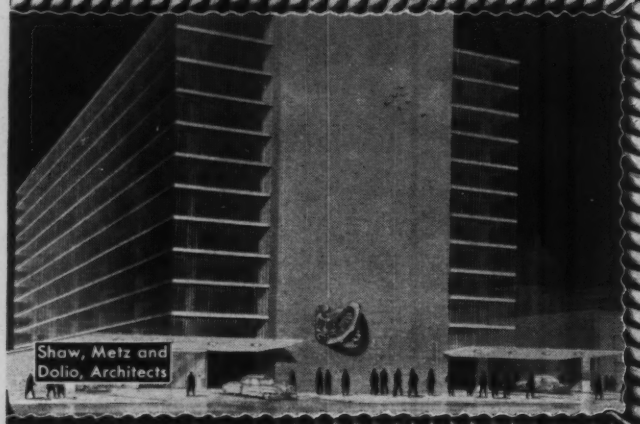
Shaw, Metz and Dolio, Architects

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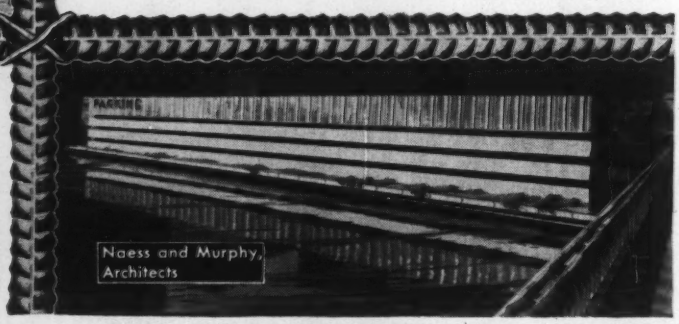
Naess and Murphy, Architects

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

AKRON GETS ALARMED—A probe of charges of shoddy workmanship in VA-insured houses in the Columbus area, plus other instances of loose practices in the homebuilding field in Ohio, have had sharp repercussions in Akron. There, the City Council is considering a stiff ordinance that would require builders to post a performance bond on each job equal to the contract price; and compel them to file with the City Building Department a copy of their contract with the buyer together with complete plans and specifications. Builders would be subject to annual registration, which the city could revoke or refuse to renew on evidence of incompetency and bad faith. The ordinance also would provide for fines of up to $500 for violations.

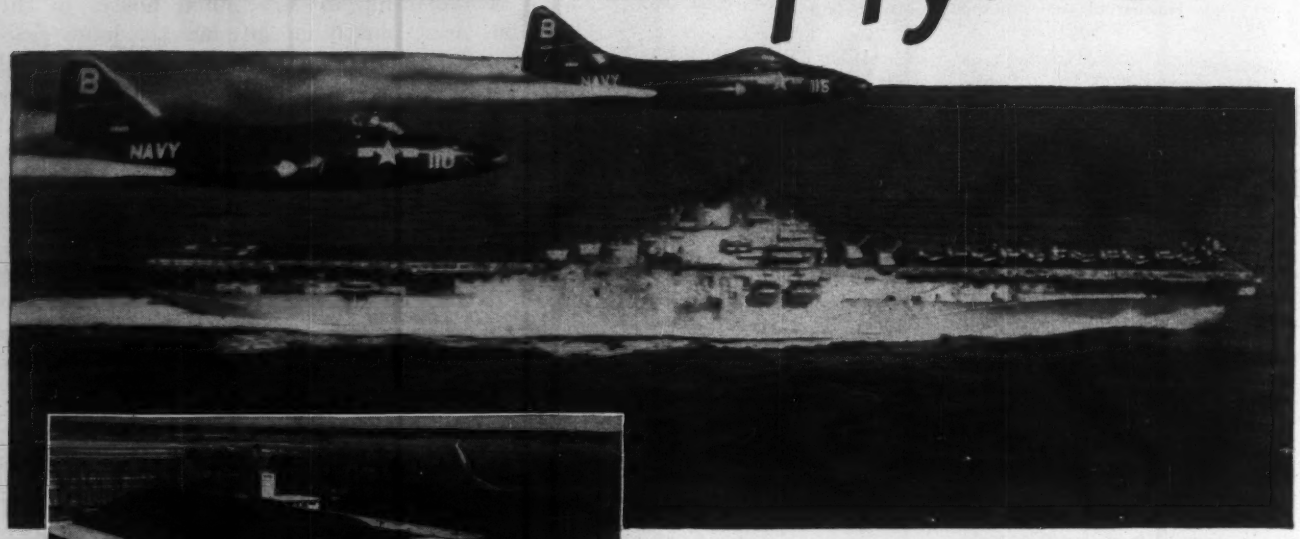
WHAT EVERY MOTORIST SHOULD OWN—When you enter the parking lot operated by the Downtown Merchants Parking Assn. in Oakland, Calif., the attendant directs you to a vacant space by looking at a TV screen. The lot has been equipped with the pioneer installation of RCA's closed circuit spotter known as "TV EYE." The camera is mounted atop a light standard overlooking the 225x300 ft lot and is connected to a receiving set in the attendant's booth. A special mechanism enables the camera to scan the lot continuously and thus give the attendant a constant picture of available spaces.

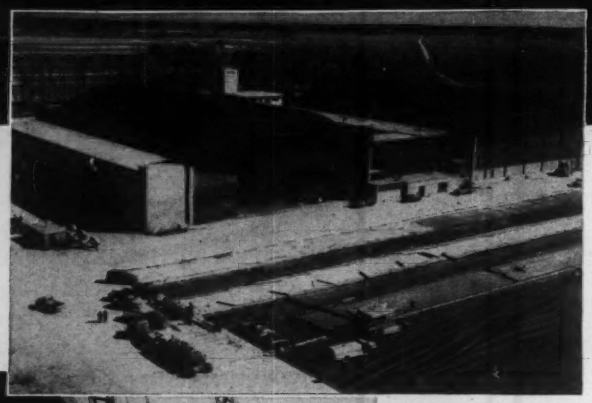
BUILD TO THE MIDDLE—Turnpikes should be built to be expanded in the middle—not on the outer lanes—according to J. Gordon McKay of the Ohio Turnpike Commission.

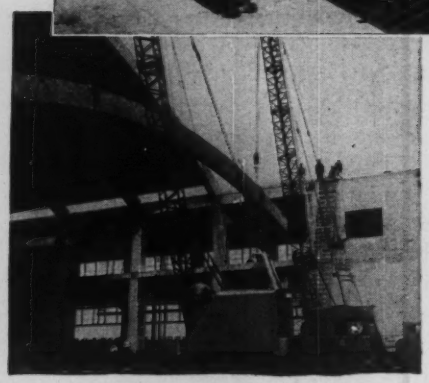
Says McKay: Engineers should start planning any present four-lane road with a median strip at least 96 ft wide. Then, when a third lane is needed, it should be put in the median strip. That way, new construction wouldn't interfere with signs, access roads, planting, gas stations and restaurants; construction equipment would have a wide area in which to work without interfering with traffic on the pike; drainage structures needn't be disturbed.

THAT CLOSE BID—The telephones in our office began to ring soon after subscribers in New York got their April 7 issue of ENR. We had made an error in our report of the bids on the Long Sault Dam on the St. Lawrence. The head on that story said that the bid of the Walsh-Perini-Morrison-Knudsen-Kiewit and Utah Const. combination was low by 1%. Actually, the margin was only 0.1% on the $26-million job. Our contractor friends wanted the record set straight. So, belatedly, we are doing that. When a contracting group lands a big job like that because its closest competitor did not make a distinction between the cost of two types of cement in making his estimate, that must set some kind of a record.

TO KEEP 'EM *Flying*







Hollow precast arch ribs, each 164 ft. x 3 ft. x 1¾ ft., twelve for each hangar, were precast at job site. The precast, thin-shell roof consists of 924 panels, each 24 ft. long, 4 ft. wide, with ribs 10 in. deep and 1¼-in. shell.

Hollow, Precast Concrete Arch Ribs 164 Ft. Long Support Precast Thin-Shell Concrete Roof for Navy's Oceana, Va., Aircraft Maintenance Hanger

● Forward-looking in all of its operations, the Navy has been a pace-setter in precast concrete design, as illustrated by this $2.1-million, twin-barreled Aircraft Maintenance Hangar at U. S. Naval Air Station, Oceana, Va., one of the east coast master jet air bases where Air Groups who man our carriers are trained and their jets maintained at peak operational efficiency.

Each barrel is spanned by 12 hollow, precast, reinforced-concrete arch ribs, 164 ft. long, rising parabolically above heavy concrete abutment bents which also form the frame of the two-story office sections. Arch ribs were precast at job site in half sections, each 82 ft. in length, weighing 22½ tons. The half arches were hinged at each end, and after full dead load was applied, hinges were welded and concreted to form fixed ends.

The arches support the thin-shell concrete roof, consisting of 924 panels, 20 with sloping overhang, cast at the job site on concrete forms, using the Vacuum Concrete, Inc. method.

Precise casting and erection schedules resulted in assembly-line precision in building a hangar which admirably fits its purpose—with overall economies that merit the attention this type of advanced prefabrication is receiving from designers all over the country.

Lone Star is proud of the privilege of supplying 23,405 bbls. of cement for this outstanding project—quality cement, every barrel of it, as reflected in a finished structure of outstanding character.

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Oceana, Virginia

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DISTRICT PUBLIC WORKS OFFICER 5th NAVAL DISTRICT

Engineers:
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KISTNER, CURTIS & WRIGHT
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General Contractor:
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WASHINGTON OBSERVER

The housing boom is healthy—That's the conviction of the Administration. Pres. Eisenhower's advisers acknowledge they keep a sharp eye on all sectors of the economy, to be ready to act in case of a new spiral of inflation, or a sharp downturn. And what they see in the record housing business gives them no fears.

Local stop-look-and-see shutdowns on FHA housing certifications in most cases are temporary. And, as in the case of Dallas, Tex., where builders had to be confident they had buyers before getting even conditional construction go-aheads, the families have been coming in, and buying.

So the Administration sees no reason—now—to tighten up on credit or anything else. The White House will try to get authority from Congress to manipulate interest rates—up and down. But it's a precaution—to be used equally for a housing lethargy, as much as for a boom.

•

States generally go on record favoring more federal spending for highways in their answers to a questionnaire sent out by the American Assn. of State Highway Officials, who did the job for Sen. Gore, chairman of the roads subcommittee of the Senate Public Works Committee (see page 26).

All want more money for roads, but they want something different than either the Gore bill or what the Administration proposes.

Governors want the federal government to take over the interstate roads completely, without benefit of any state matching—or a minimum of say 5% of state money.

They want federal grants to states to continue or increase. States would use this money to build other roads in their state.

Governors say they can meet matching requirements of theAdministration road program—but they don't like the ceiling called for in the plan which means they could get only $600 million per year in federal-aid funds.

Governors like increased federal aid proposed in the Gore bill but they doubt their ability to come up with the $1.25 billion per year of matching funds the proposal would require. This year, state matching funds total about $700 million.

•

State expenditures for highway construction keep rising according to new figures for 1954 just released by Department of Commerce.

Total highway spending including construction hit $4.1 billion; up about 15% from 1953. On the other hand, spending for construction alone—which amounts to about two-thirds of the total—is up about 22% in 1954 over 1953. 1953's increase over 1952 on capital outlays, i. e. construction, was only about 9%.

Total capital outlay figure for states was $3.3 billion which breaks down as follows: schools, $311 million; regular state highways, $2.1 billion; toll highways, $444.5 million; health facilities and hospitals, $236.1 million.

Revenues from motor vehicle licenses produced about $1 billion during 1954, an increase of about 8.6% over the year before.

•

Look for naming of new Coordinator of Public Works Planning in a couple of months—sometime before Congress finishes this summer. That's what top Administration officials now expect.

Best guess is that Gen. Bragdon will get the new job. He's now the official at the Council of Economic Advisers riding herd on public works plans, both federal and non-federal.

Opponents in Corps of Engineers, Bureau of Reclamation and other agencies still hope to block this. But they aren't getting the President's ear.

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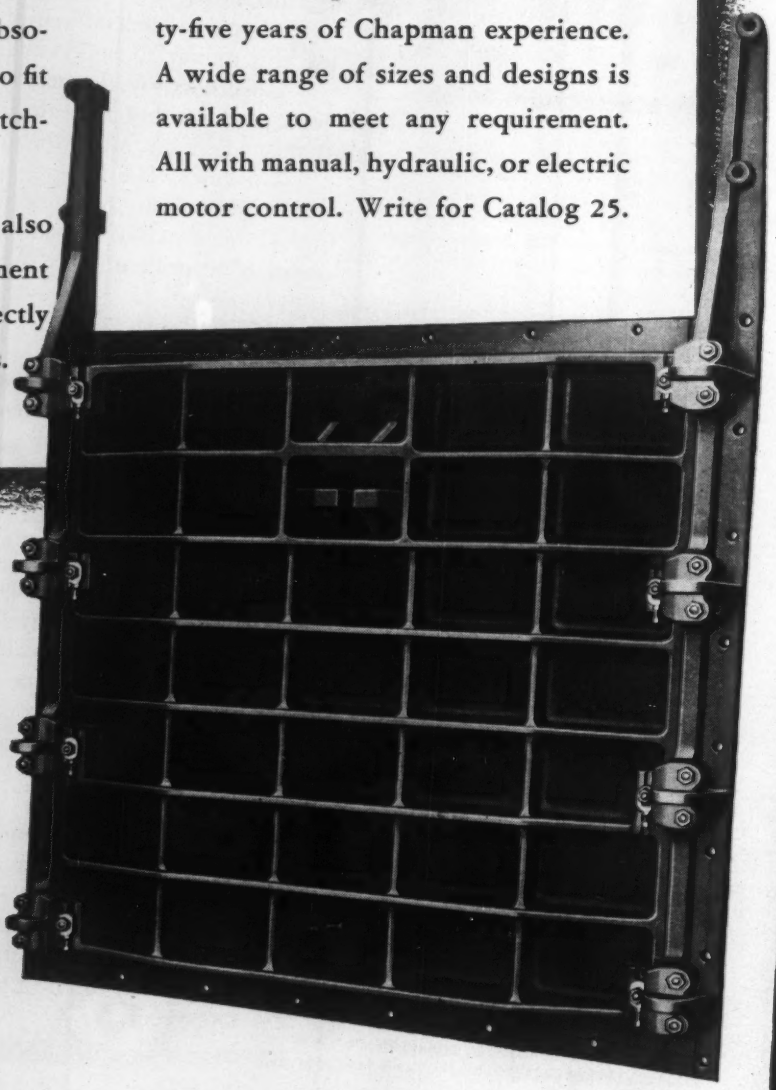


THE CHAPMAN VALVE MFG. COMPANY

INDIAN ORCHARD, MASS.

AEC Lets Down the Barriers:

Atomic Power—A Big, New Field for Builders

The Atomic Energy Commission has taken the first step to set off what is expected to mushroom into a $35 to $80-billion private atomic power construction boom during the next 25 years.

AEC's action was issuance of the first set of regulations under which private companies can obtain licenses to build and operate their own nuclear power plants. Heretofore, the only way a private firm could produce atomic power was under direct contract with AEC, and only one major plant of this type—Duquesne Light Co.'s 60,000-kw pressurized water reactor plant at Shippingport, Pa.—has been started.

AEC has received five other applications for large plants, and more are expected before the year is out. Pending applications call for a total outlay of more than $200 million to put an estimated 450,000 kw to work in the next three to five years.

The prediction on atomic power construction outlays in the next 25 years is based on figures presented by W. Kenneth Davis, the 36-year-old engineer who heads AEC's Reactor Development Division. Davis sees nuclear power playing an ever bigger role in the nation's electric power generating capacity.

He thinks the atomic construction boom will reach its peak within 10 to 15 years from now when industry becomes convinced atomic power is here to stay. He says the construction boom will come on suddenly and grow rapidly after 1965.

• **Construction costs**—Basing estimates on current per-kilowatt costs of installation, you can figure how much construction of atomic power facilities will cost. Estimated current costs of atomic power construction run from $200 to $450 per kilowatt.

Here's what Davis's timetable for installed nuclear capacity over the next 25 years might amount to in total construction:

• 1960—2 million kilowatts of nuclear capacity in service ($400 million to $1 billion).

• 1965—5 million working kw ($1 billion to $2.25 billion).

• 1970—27 million kw ($5.4 billion to $12 billion).

• 1975—83 million kw ($16 billion plus to $37 billion).

• 1977—100 million kw, as much as the U. S. now has in conventional plants ($20 billion to $45 billion).

• 1980—175 million kw ($35 billion to $80 billion).

Of course, per-kilowatt cost of installing atomic power will go down as technological difficulties are ironed out. In fact, they'll have to go down to become competitive with conventional sources.

But at rock-bottom, Davis's kilowatt estimates should be multiplied by the $130-$140-per-kilowatt costs of conventional power installations. This comes to a total minimum outlay for nuclear power construction by 1980 of at least $22.5 to $25 billion.

Under AEC regulations—when they become effective about a month from now—private companies will be licensed by AEC to build and operate atomic power plants in about the same way that a utility is licensed by the Federal Power Commission to build and operate hydro-power dams.

AEC will have to have complete information on what's to be done, who's to do it, and how. But to an applicant who can meet the standards AEC will grant a license for the private production of atomic power.

The Atomic Energy Commission will continue to own all atom fuel, leasing it out as needed. An operator will have to pay for what he uses. He will be required to keep strict records, be ready for AEC inspection, lock up borrowed classified data in accordance with security regulations and meet rigid criteria for protecting the health and safety of the public. Here's what he will be able to do:

• Build and operate nuclear power plants. There's still no assurance that atomic power will be competitive with power from conventional fuels for some time, but it will be eventually, according to the experts.

• Get a 40-year license and assurance of fuel to keep his plants going. Chances are developments in the next few years will improve reactors to the point where they'll breed almost as much new fuel as they burn.

AEC has several kinds of licenses to fit different purposes. At this stage of the game, many companies will want to get a research and development license which will let them prove out, or improve, power reactor technology. AEC can subsidize some of the applicants, if it chooses.

This category, too, lets in all kinds of enterprises—not only electric utilities, but universities, equipment makers, medical and other endowed institutions or combines of interests who join together to get into the business.

Commercial or industrial licenses actually restrict the company to the construction and operation of a reactor for commercial production of power or some other specific industrial purpose. So far, no power reactor either under construction or planned yet satisfies AEC as a surefire economical and practical power plant. AEC can't subsidize this kind of plant.

Operators' licenses are needed by the individuals who will actually run atom power plants, from supervisors on down to the men who turn gages. Regulations telling how to get them are not out yet, but there's no hurry—it'll be another two years before even the first private plant starts operations.

Power plant owners also must have a separate license to use government-owned fuel. This can be applied for at the time application is made for the plant license.

• **Basic requirements**—For any license, AEC will require that applicants are reliable and qualified through training and experience to use atomic fuels safely; that they have adequate equipment and facilities to protect health and minimize danger to life or property; and that they can show the financial ability to operate a going business.

For those not familiar enough with nuclear power to make such detailed statements, AEC has several approaches. These permit companies to come in and study what's been done in the power reactor field and in manufacture of reactor components.

To get at this information, however, the businessman and his staff have to sign a contract with AEC. When he finds out what he wants to know and trains himself to put it to use, he can then apply for a license which will let him out from under the stricter controls in a contract.

(*Continued on page 22*)

. . . Atomic power

AEC licenses will govern all reactors, gaseous diffusion and other isotope separation plants, chemical processing and fuel element fabrication plants. About the only portions of the entire atomic power industry AEC won't license at this point are weapons fabrication and uranium processing.

AEC took its time getting out the new rules. It's been almost a year since the law was changed to permit private ownership and operation of atomic facilities, and Congress has been on the commission's neck ever since. Businessmen from electric utilities, electrical equipment manufacturers and chemical companies have been working with AEC on the project.

Members of the Congressional Joint Atomic Energy Committee have been highly critical of the commission. They still complain that too much information is being kept secret; the law clearly states that all possible reactor data should be completely declassified.

In spite of pressure that will continue to be brought to bear on AEC to make still easier the private venture into atomic power, these regulations have gone a long way toward clarifying things for interested utilities. Major restrictions that remain are only those required by the law.

The way for manufacturers to get into the game to design and construct reactors has been set up for some time. Now these new regulations show the way for a utility to enter the field.

There are no insurmountable security clearances to be faced by interested utilities. It is not necessary for everyone in the company to be cleared. For example, Consolidated Edison, probable owner and operator of the nation's first private atomic power plant, may have only about 20 key people cleared. These will be the engineers and scientists who will work directly on the fuel element for the plant. (Babcock & Wilcox, contractor for the design and construction of Consolidated Edison's reactor, will have to get many more individuals cleared.)

When it comes to actual field construction, the owner must get a construction permit but there will be no special requirements on the constructor. Contractor personnel will need no clearance unless involved in field work on the reactor itself. And presumably, erection of the reactor would be handled by the firm which manufactured it.

The same may be said of engineering firms involved on design of any portion of an entire nuclear power plant. Only those individuals (if any) who must have classified information in order to do their jobs will need to be cleared for security.

LEADERS in the formation of the Allied Masonry Council were (left to right) Harry C. Bates, president of the Bricklayers, Masons and Plasterers International Union; John Taheny, president of the Mason Contractors Association, and Douglas Whitlock, chairman of the board of the Structural Clay Products Institute.

Masonry Groups Join to Form Council

Major producers, contractors and a union in the field of masonry construction have joined to form the Allied Masonry Council. The organization's purpose is to raise building quality and reduce building costs.

Founders of the council are the Structural Clay Products Institute, the Marble Institute of America, the Indiana Limestone Institute, the Building Stone Institute, the Mason Contractors Association of America and the Bricklayers, Masons and Plasterers International Union of America, AFL.

Douglas Whitlock, chairman of the board of SCPI, will serve as chairman of the council.

He said producers of masonry materials would continue to be competitive with each other. "However," he added, "all of us have something in common. All of us are engaged in the exterior facing of commercial and industrial buildings, schools, hospitals, churches and institutions of all types.

"The masonry product producers have research programs with a mutual goal—to reduce the cost of end-use or in-the-wall masonry by improving present products, finding new ones and developing new ways of applying them. By pooling this information and making one organization's findings available to all supporters of the Allied Masonry Council, we will be in an excellent position to provide a service of unprecedented value to the industry, the architect, the investor and the general public."

Whitlock said the Allied Masonry Council also plans to:

- Develop products and techniques to aid architects in designing buildings for critical defense areas and sections where there is high earthquake and corrosion damage.
- Function as a public advisor on modernization of building and fire protection codes.
- Encourage acceptance of modular coordination to reduce waste in materials and labor.
- Function as an advisor to the government on materials conservation, in the event that a defense emergency should arise to create need for such a program.
- Disseminate information on new masonry products and services to architects, investors and the general public.

Whitlock said masonry producers already have developed or are developing a number of new products and techniques. Among these are a lightweight brick which has great strength but weighs only about half as much as ordinary bricks, a new six-in. through-the-wall unit, large clay panels for curtain-wall use, thin marble slabs for exterior building veneers, thin limestone slabs for curtain walls, limestone sandwich-type panels which will serve both as complete building wall exteriors and interior finishes and new setting techniques for ledge stone and split face stone which will substantially reduce cost.

Engineer Building

New York officials warn they will oppose any plan to move away from city

The four Founder Engineering Societies will have to buck the determined opposition of New York State and City officials to get clearance for construction of a new headquarters building in any other city.

State Attorney General Jacob K. Javits made that clear last week in a letter to Richard C. Patterson, Jr., New York City Commissioner of Commerce and Public Events.

Javits said the state would oppose any plan of the engineering groups to dispose of their New York headquarters building and move elsewhere. He said the professional societies were incorporated as the United Engineering Trustees, Inc., by special state legislation that provided that the corporation would "perpetually maintain its headquarters" in New York City.

The present headquarters, the Engineering Societies Building at 29 W. 39th St. in New York City, was built with a $1,050,000 gift from Andrew Carnegie in 1904. Should the societies decide to move away from New York, a legal question might arise as to their right to dispose of the present headquarters building and apply the proceeds from its sale to construction of a new headquarters.

Javits did not say what action New York State might take to keep the engineering headquarters in New York City. But he declared: "The wishes of the donor of a charitable gift should be respected."

• **New York's committee**—Javits's statement lent support to efforts of New York City officials to keep the headquarters of the engineering societies in the city. A week earlier Patterson appointed a five-man committee to select a possible site for a new headquarters building and arrange financing for its construction.

The members of the committee are William Zeckendorf, president of Webb & Knap, Inc., the chairman; Deputy Commissioner of Commerce Martin Dodge, the executive secretary; Ralph J. Cordiner, president of General Electric Co.; Dr. Luther H. Gulick, City Administrator; and Mervin J. Kelly, president of Bell Telephone Laboratories, Inc.

Officials of the engineering societies have also considered proposals from Philadelphia, Pittsburgh and Chicago to move the headquarters to one of those cities. Various inducements in the form of free sites or cash grants also have been proffered. Last week Pittsburgh's earlier proposal was augmented by an offer from the Mellon family to provide a $500,000 research grant if the headquarters were moved there.

A committee of past presidents of the societies recommended in February that Pittsburgh's offer be accepted as representing "the lowest capital cost and lowest annual expenditure," but no action in support of the recommendation has yet been taken by any of the societies. In the meantime, New York City has greatly increased its efforts to convince the engineering groups that their best interests will be served by remaining there.

The four societies that own the present New York headquarters building are the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. A fifth group, the American Institute of Chemical Engineers, has decided to join in building the new headquarters.

Wastes Research Program Lures Industry's Experts

Industry saw fit to send its wastes disposal specialists back to school last week to hear and discuss basic principles and new research findings of biological waste treatment. From firms in paper, oil, dairy, pharmaceutical, food, rubber and chemical industries they came to Manhattan College for as thorough a conference-handling as this subject has had.

Conference delegates from as far off as Miami, Fla., and Berkeley, Calif., took part in discussions of some very technical programmed subjects for the first half of a three-day conference on the New York City campus. Next, a half-day of discussion was devoted to critical evaluation of aeration equipment. Not until the final day did design papers and industrial waste and municipal sewage plants come into discussion.

Municipal engineers and consultants had their part in the conference. But the true significance of the meeting appeared in the great number of industrial people—aside from the very few invited as participants—who came to listen to professors and researchers expound on the highly technical, and often theoretical, aspects of biological waste treatment problems.

Conference proceedings, to be published, are expected to form a text on the aerobic side of biological engineering.

A conference next year is planned by Manhattan's civil engineering department to explore similarly the anaerobic processes of waste treatment.

Relocating Utilities

Report places expense of utility relocation at 2.6% of highway costs

Congress finally has the yardstick it needs to estimate the cost of utility relocations in highway construction. A Bureau of Public Roads report last week indicated that the cost exceeded 2.6% on $1.7 billion of roadbuilding by the states in 1953.

Cost of relocations reported by the utilities themselves for this 1953 program amounted to $35.5 million, of which $8.5 million was reimbursed. If allowance is made for utilities that failed to answer the questionnaire, the total would go up to at least $45 million or 2.6% of the highway construction cost.

While the new BPR report was still at the printer's, the Senate roads subcommittee heard renewed arguments from the utilities that government should pay the cost of relocations on highway projects. Spokesmen for the telephone companies and the electric utilities—both publicly and privately owned—told the senators that the highway user or the general public ought to shoulder the costs now borne by their customers.

There is little sentiment in Congress now for greater use of federal-aid funds than is presently permitted. These funds now apply to reimbursement costs on the same matching basis as they do to other costs wherever state laws authorize repayment to the utilities.

Three states—California, Connecticut and New Jersey—reimburse utilities for relocations on expressway projects. Half of the money returned to the utilities in 1953 for relocations on public right-of-way came from expressway projects in these states.

Electric power and telephone systems accounted for nearly 70% of the $35.5-million relocation cost reported by the utilities for state highway projects in 1953. Power system changes came close to $12.5 million, with the electric utilities paying more than $9.5 million of the bill. The telephone companies carried a bigger load, paying more than $10 million of costs that approached $12 million.

Gas companies put up nearly $5 million for relocations of their facilities. Their reimbursement was slightly less than $1 million. Water systems, most of them publicly owned, fared better. They got back nearly $1.6 million of the $3.8 million expended on relocations. Sewerage facilities, other pipelines, telegraph lines and transit systems make up the rest of the $35.5-million relocation total.

Better Equipment Coming up

Designers do not expect radical changes in next few years, but say they aim at lighter weight, easier handling machines

E. E. Halmos, Jr.
Managing Editor

There won't be any radical changes in construction equipment over the next few years—though, of course, there will be constant improvement.

Construction men won't be offered the chance to buy any atomic, rocket or jet-powered equipment for quite a while. But they will see things like tubeless tires for all types of off-the-road equipment; equipment that's lightweight for transportability but heavyweight when at work; more and more horsepower in their prime movers without proportionate increase in lack of maneuverability; more and more emphasis on the human being who must control and operate the machines.

There doesn't seem to be much prospect of price reductions, but buyers are likely to get more and more machine for their money.

That's a summary of the opinions of the men who design the machines construction men use—the Society of Automotive Engineers—whose earthmoving section held its sixth annual meeting at Peoria last week.

• **Man vs. machine**—Biggest drive in the development of improvements for the huge machines now on the drawing boards and in the shops is the human element.

It is becoming clearer that some sort of a compromise is on the way between the maximum efficiency of the machines that can be built, and the maximum efficiency of the men who must operate them.

"We can of course make machines as big and as powerful as anyone would ever want," commented one designer. "But when it gets too big for a man to wrestle the controls, we have to put in helper motors—power steering, automatic clutches. Mechanically, that's inefficient. But physically, it's a must."

That's what is behind improvements in the newer machines like softer seats, better placement of controls, better visibility for the driver, fluid-drive type clutching.

• **Weight vs. power**—Nello Teer Jr., North Carolina highway contractor, undertook to tell the machine designers what it's like to set up a big highway contract job. And he made two pleas for help.

"We're not nearly so much interested in initial cost as in final cost—what will the machine do for us," Teer said. "And please, somebody, make us a big tractor with enough aluminum or something to make it light enough for us to get it from one job to another."

He got an almost immediate answer on the question of lightness from Brig. Gen. Howard Ker, of the Army's Corps of Engineers, who said that among the machines now under development for his Corps is an 11,000-lb tractor that can be transported by air and weighted to 50,000 lb by adding water ballast at the job site.

Pressed for details, Ker reported that the new tractor is under development not by any of the group represented at Peoria but by Fairchild Aircraft Corp. The tracklaying machine is to be powered by two 220-hp diesel engines. It will be usable as a prime mover, bulldozer, auxiliary electric light plant and compressor.

While they were on the subject of weight, the engineers heard a plea from their national president, C. G. A. Rosen, to get behind a movement to amend the 18,000-lb axle-load limit in most states to increase transportability of construction machinery.

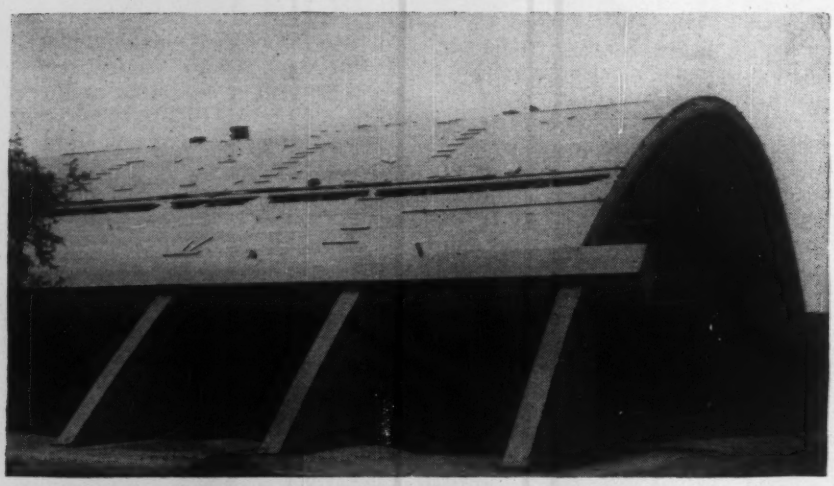
• **In the future**—Tubeless tires didn't appear as a subject for formal discussion, but were discussed at informal gatherings of the two-day meeting.

According to rubber company engineers, such tires are now actively under test for every conceivable type of construction equipment—and probably will be standard equipment for such machines within two years. Their advantages are particularly in the matter of heat—they run about 20% cooler than standard tires under most operating conditions. Major disadvantage, from the viewpoint of contractors, is that present day machines would have to have at least new rims on all wheels.

There was a report from the University of Achen, in Germany, where a Dr. Garbotz has been conducting experiments in earthmoving, of something new in scraping techniques that makes possible lifting a "sheet" of earth into a scraper at savings of as much as 30% in costs.

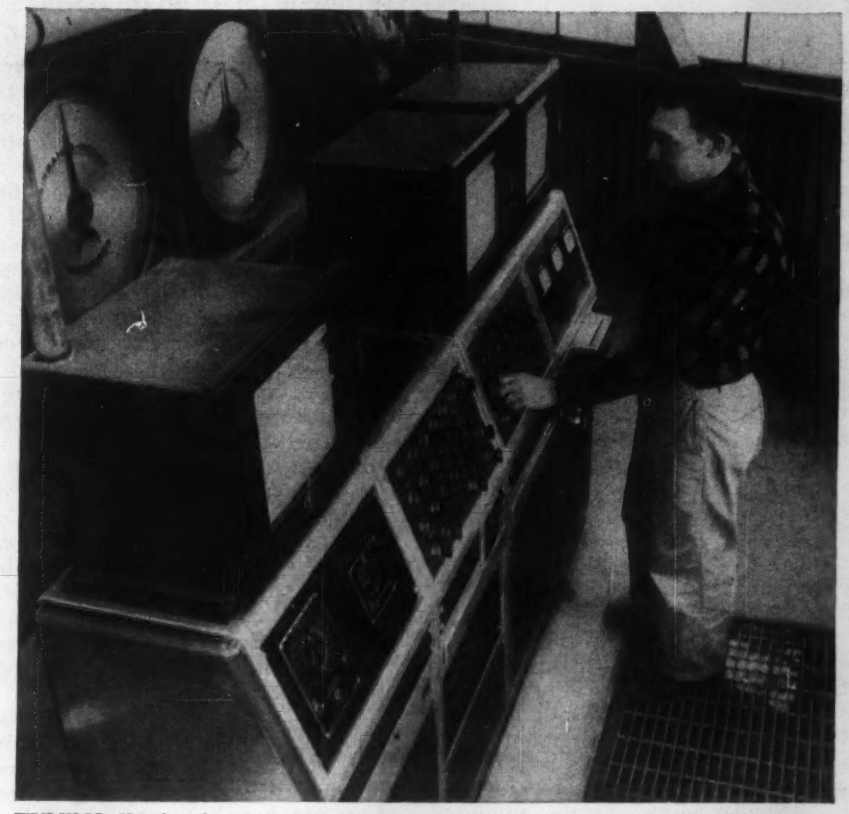
It works this way, according to Mr. Rosen: The Germans have actually sawed (or cut with a plow) deep cuts in the earth on either side of the scraper blade to eliminate distraction of the blade from a straight course by protruding objects. Then the scraper blade, vibrating at a very high frequency, actually saws its way through the earth, lifting it in a sheet into the carrier.

There was a report of developments of air-transportable shovels; of a fox-hole digger that can dig holes at one a minute; a prediction that shovel capacities would go up from the present 2-yd bucket to a standard 4 yd; of improvements in maintenance facilities.

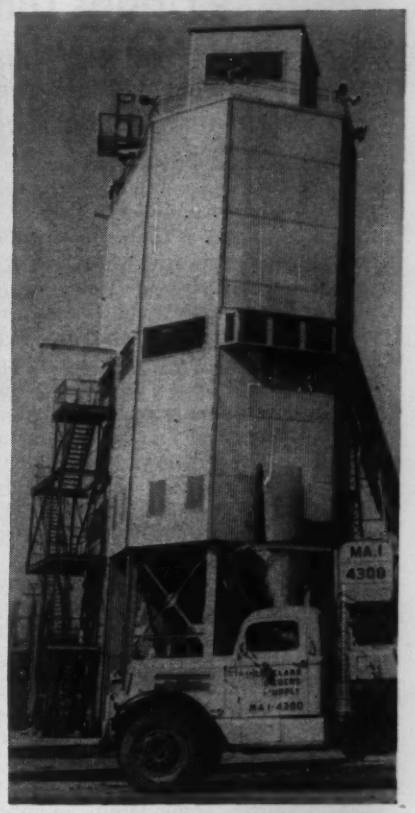


California Gymnasium Has Lamellar Roof

A 132-ft span lamellar roof, one of the largest in the U. S., covers the new gymnasium at the California Institute of Technology in Pasadena. The structure is 100 ft long and has lamellas made of 3x18-in. timber about 15 ft long. The diamonds are 5 ft on centers and about 12½ ft long. A thrust beam on seven buttresses supports the lamellar roof, and a glued end arch 7x18 in. transfers load to the concrete supporting structure. Design was by Marsh, Smith and Powell, architects, and Hillman and Nowell, structural engineers. General contractor was Escherich Brothers. The lamellar roof was fabricated by Sumerbell Roof Structures.



TUNING IN the electronic controls that mix a batch of concrete to specified proportions and discharge it into a waiting truck for delivery.



CONTROL ROOM where bay windows project is nerve center of the operation.

The Latest: Electronic Concrete Batching

Ready-mixed concrete plants, already one of the marvels of mechanized construction, took another step forward in the automation process early this month when the Cleveland Builders Supply Co. began operation of a new installation incorporating complete electronic control of the batching process.

Punched cards, one for every mix that the plant sells, are dropped into the mechanism and automatically activate the electronic controls. In proper order and in proper amount, cement (any one of three types), aggregates in whatever of six different sizes are required and water are weighed into the mixer. Mixing time is also governed by the controls as is the tilting of the mixer and its discharge.

The controls can also be set to omit water and supply dry ingredients for mixed-in-transit concrete.

• **Substantial savings**—An increase in both speed and accuracy of batching was the objective sought in the 200 cu yd an hour plant, said to be the largest permanent commercial installation in the country. Compared to the company's other three plants, in which operators using hand controls shut off the flow of materials to the mixers, the new plant promises to save about $12,000 worth of cement and $4,000 worth aggregates a year.

The reason for this is that, under hand operation, the amount of cement, for example, can only be controlled to within about 25 lb, either over or short of the amount called for in a 6 cu yd mix. With electronic cutoffs on the material gates and valves, this variation is reduced to 4 lb. Similar reductions in variations are also obtained for the aggregates and the water in the new plant.

The control panel is located in a glassed-in room 70 ft above the ground in the 105 ft high plant. One feature of the room is a projecting bay window from which movements of the trucks on the ground can be observed and directed.

Orders for concrete batches are received in this room by radio. They are accompanied by advice as to the mix proportions required (which determines the particular punched card to be used) and the number of the truck that will make the delivery.

When the truck's arrival is reported the operator drops the punched card, corresponding to the mix proportions specified, into the slot in the control panel and pushes a button. The electronic controls carry on from there, activating the mechanisms for proportioning, mixing and discharging of the concrete into the waiting truck.

• **Other features**—In addition to its electronic controls, the new plant also has other features. Located on the Cuyahoga River, its aggregates are brought in by self-unloading boats that discharge to storage piles—35,000 tons for sand, 45,000 tons for stone. Five conveyor belts move the materials to the overhead bins in the batching and mixing building as required. Cement is received by rail and pumped either into a 4,000 bbl standby bin or into the cement compartments at the top of the building. Built at a cost of slightly more than $1 million, the new plant will serve customers within an 8 to 10 mile radius.

The electronic controls were especially designed for the plant by Fairbanks-Morse & Co., Chicago, at the instigation of the Butler Bin Co. of Waukesha, which had the major contract for equipping the plant. The overall design of the installation was carried out by Wilbur Watson Associates, consulting engineers, Cleveland, in cooperation with officials of Cleveland Builders Supply Co.

Highway Hopes Dim

House committee begins hearings as leaders seek compromise on road bill

The House of Representatives began a search this week for a compromise plan to step up highway construction that might stand a chance of winning congressional approval this session.

A House subcommittee opened highway hearings on highway legislation shortly after the end of Senate hearings in which both the President's 10-year, $101-billion "grand plan" and a counter-proposal by Sen. Albert Gore, Tennessee Democrat, seemed hopelessly bogged down.

House leaders want to try a different course. Faced with obvious Senate opposition to the Clay plan—and filled with doubts of their own about the bond financing scheme—they are looking for a means of doing the job that Congress can endorse.

Their objective is two-fold: to complete the interstate system on a fast schedule, preferably with pay-as-you-go financing, and to increase the amount of matching funds for other roads in the 700,000-mi federal-aid network.

As a starter, some House members are exploring a plan to cook up a separate and distinct highway emergency measure that would not encroach upon the matching funds voted in the Federal Aid Highway Act of 1954, which set up $875 million a year for each of the two fiscal years starting July 1.

Here are some of the ideas they are talking about for a special measure that would complete the interstate system in 10 years without cutting down the federal-aid authorizations now in effect:

- Pay-as-you-go federal financing for 90% to 95% of the cost of the interstate system, to be built by the states.
- Increasing federal revenues by stepping up the gasoline tax one cent or more to pay a big part of the interstate cost.
- Continuing last year's $875 million of matching funds for other federal-aid roads. The states would get for these other roads the entire amount voted last year, including the $175 million originally earmarked for interstate projects.
- Giving the states federal authority to buy right-of-way for the interstate system and perhaps setting up a cushion fund of $2 billion to $3 billion to make advances to the states for this purpose. If necessary, bond issues might be used to raise the money for the cushion fund.

These possibilities suggest the scope of the study that the House group is tackling. Hardest to sell would be a higher federal motor fuel tax to help the pay-as-you-go plan for financing construction by annual appropriations.

Congressmen have shown a willingness to consider an increase in gasoline and diesel taxes, but the states object strenuously. State governors have only recently switched over to acceptance of any federal motor-fuel taxation.

Ability of the states to match federal-aid funds would not be too much of a problem under the 1954 Act. But matching would become more difficult if federal aid went up. And the difficulty would become severe if an increase in federal motor-fuel taxes shut off that source of additional revenue for the states.

The states' matching ability was a principal consideration in the Senate committee hearings. The Administration bill would reduce state matching to about $715 million a year, while Sen. Gore's bill would require $1.265 billion.

C. Dwight Curtiss, Public Roads Commissioner, gave the committee some answers on whether the state highway departments think they could match federal aid proposed in the two bills. On the Administration measure, the results were 43 yes and 3 no; on the Gore bill, 19 yes and 25 no.

Similar answers on the Administration and Gore bills came in from the state governors, in reply to a telegram sent out last month by the committee.

Combine Is Low Bidder For St. Lawrence Job

A joint venture of Merritt-Chapman & Scott, Corp., New York, and Savin Construction Corp., East Hartford, Conn., submitted the low bid of $36.2 million for construction of the United States half of the Barnhart Island powerhouse of the St. Lawrence Power Project.

The six bids for the job ranged as high as $43.7 million. The contract is for a reinforced concrete gravity structure with a maximum height of approximately 160 ft above the foundation and a length of 1,565 ft, half the overall length of the international power plant.

The power plant is of the modified outdoor type. It will have 16 units, with the erection bay, control room, offices and miscellaneous shops enclosed in a metal, masonry and glass building. Bids for the powerhouse and dam on the Canadian side will be taken early next month.

Major quantities involved include 1.6 million yd of embankment, a comparable amount of earth excavation, 890,000 cu yd of concrete and 30,000 tons of steel. Construction will proceed on a year-around basis with completion scheduled for September 1958.

Drainage District in Texas Compelled to Hire Engineer

As a result of court action taken by the Texas Society of Professional Engineers, the Fort Bend County Drainage District of Texas recently agreed to employ a registered professional engineer to pass upon the adequacy of work already done under an improvement program and to approve plans and supervise construction of the remainder of the work.

The work consists of constructing a major system of drainage ways and outfall ditches designed to remove storm water from a large area of the county adjacent to the Brazos River. Estimated cost is $240,000. At the time the court action was begun the work completed by the contractor amounted to $124,681.

Plans for the work were prepared by an engineering staff set up by the district. This staff was composed largely of young engineering graduates without sufficient practical engineering experience to qualify for registration in Texas.

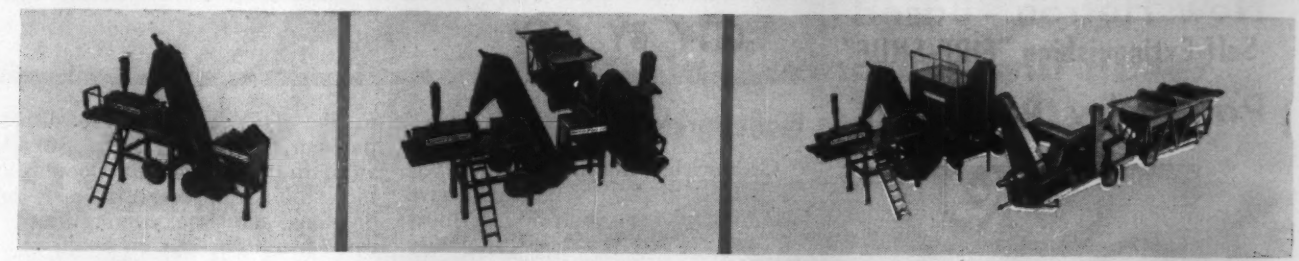
The state society decided against charging these young men with violation of the registration law because it found that many young graduates have not been properly informed as to what they can do under that law. Also, the young engineers have been assured by the county judge, who also is chairman of the drainage district, that their operations were exempt and that they did not need a license to perform the type of work required of them by the district.

William A. Roberts Dies; Head of Allis-Chalmers

William A. Roberts, 57, president, Allis-Chalmers Manufacturing Co., Milwaukee, died April 12, following a heart attack he suffered April 1.

His latest service to construction was as a member of the President's Advisory Committee on a National Highway Program—the so-called Clay Committee—but he had been active in the industry for many years. He served a term as regional vice president of the American Road Builders Assn. and was associate director of the Construction Industry Manufacturers Assn. for a number of years. At the time of his death he was chairman of the Wisconsin Turnpike Commission, which was studying proposed toll projects in the state.

Mr. Roberts' first job out of school was with a roadbuilding contractor, and when he joined Allis-Chalmers soon thereafter, he entered the Tractor Division, which he eventually headed. Mr. Roberts had been president of Allis-Chalmers for four years.



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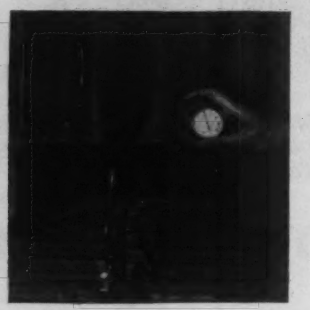

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CITY BY CITY

Fight for Water

Greenwich, Conn.—Greenwich is contesting a pact that would give half of its water supply for the next 75 years to two Westchester County (N. Y.) towns—Port Chester and Rye.

Mianus Reservoir, which lies both in New York and Connecticut, is the focus of the water supply dispute.

Fourteen months ago Greenwich Water Co. signed the 75-year contract with the Port Chester Water Works. It calls for delivery of 8 mgd of water to Rye and Port Chester—an amount that adds up to half the estimated yield of the new reservoir. (The president of Greenwich Water Co. is also president of the Port Chester Water Works, and Greenwich has sold water to Port Chester since 1883.)

Now the contract is being contested by Greenwich before the Public Utilities Commission of Connecticut. New York State comes into the picture because the watershed for a dam under construction on the Mianus River lies wholly in Westchester County.

Greenwich declares that (1) the president of Greenwich Water Co. should not be permitted to make a contract with himself, since he's also head of the Port Chester Water Works, and (2) 75 years is too long a run for any contractual obligation affecting the last water supply remaining to Greenwich.

Experts see a future water shortage ahead for Greenwich. They estimate that in 15 or 20 years the city will require all the water impounded by the Mianus River Dam. Greenwich would like to see Westchester County attach itself to the New York City water supply and leave Mianus entirely to the Connecticut community.

Spokesmen for Port Chester, Rye and Westchester County have warned that if fair treatment is denied they will move to have the water supply cut off at the state line. (Seventy years ago New York cut off the Byram River at the state line, diverting that water into the Kensico Reservoir.)

Election Aftermath

Los Angeles—Los Angeles voters have given 9-1 approval to a $60-million sewage bond issue. Funds will be used for increasing the capacity of the city's Hyperion sewage plant, and for expansions and replacements in sewage lines feeding the plant.

Last February Mayor Norris Poulson initiated a crackdown on new residential construction that might add to the city's acute sewage disposal problem (ENR Feb. 10, p. 30). He asked the City Planning Commission to withhold approval of new subdivisions and tract zoning until it could base its actions on results of the bond election.

Restrictions on building are expected to remain in effect until the situation is alleviated, which may take three years. The City Council might put the restrictions in the form of an ordinance—and, at the same time, might possibly ease them. Also, the Public Works Board is studying the situation in preparation for an April meeting when the city must prove to the State Public Health Board that it is doing everything possible to safeguard health. On the basis of this study—and the state's comments—the board may revise restrictions.

The contract with Hyperion engineers probably will be awarded within a couple of weeks. Hyperion is expected to require 10 to 13 months to complete design on the north central outfall, and no major work will be contracted until then.

Parking Project Developments

Baltimore—Baltimore has approved a contract for construction of its twentieth off-street parking project.

The city's decision leaves the garage operator, Medical Arts Building Corp., free to complete its contract with Piracci Construction Co. and to get the project started.

The three-deck garage, to be partially financed with city funds, will be the first one started in almost two years—and the first since a grand jury investigated the off-street parking program.

The president of the Board of Estimate, however, has criticized approval of the garage contract on several grounds. He raises these questions: (1) Whether the project should be considered an emergency matter, and (2) which city agency is responsible for overseeing construction of off-street parking programs?

The board president wants action taken so supervision of construction with city funds can be passed upon by qualified city engineers. Under a 1951 ordinance the Off-Street Parking Commission is given the responsibility for overseeing construction of the garage projects it approves.

Boston—Authorization for borrowing $5 million to acquire land for off-street parking facilities has been given

a final approval by the City Council.

A bill to permit the city to borrow an additional $10 million for its parking program is pending in the Massachusetts legislature. Also awaiting legislative action is a measure that would create a seven-member public authority to finance, construct and maintain an $8.5-million underground garage beneath Boston Common. This facility would handle 2,400 cars.

Milwaukee, Wis.—The Common Council has appropriated funds for building a $600,000 triple-deck parking garage in the downtown area.

At the same time, the Milwaukee Parking Commission and the Commissioner of Public Works have been authorized to hire architects and engineers to design the structure.

The garage will hold between 300 and 390 cars.

Snow-Melting Study

Hartford, Conn.—Hartford is interested in an economically feasible plan to keep traffic moving during ice and snow storms. As a result, it's conducting studies to determine whether it should adopt a snow and ice-melting system other than the use of rock salt.

Asylum Hill probably would be the first site of any facility that may be acquired. This long, steep hill is less than one-half mile from the heart of the downtown shopping and financial area. Heavy snow-falls or ice storms block the hill and stall out-of-the-city traffic in all directions.

It reportedly would cost an estimated $280,000 to install a 700-ft steam system on the hill. This system would carry preheated antifreeze to provide heating in the pavement. The solution would be circulated at a temperature of about 120 deg. To provide the heat, a boilerhouse could be built on adjacent city-owned land.

The city also is obtaining data on an experiment conducted in Canada with considerable success. It uses a chemical in the top 1½ in. of paving material.

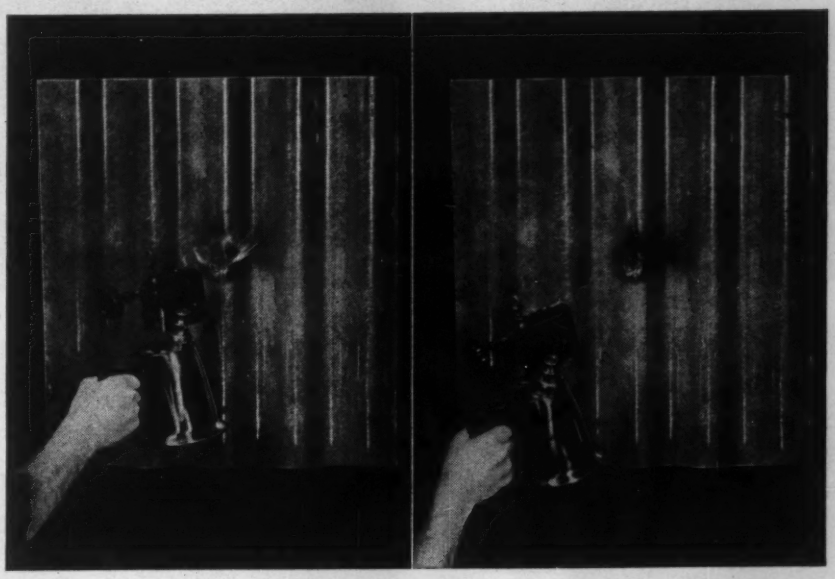
In addition, Hartford Electric Light Co. is studying costs for an electrically wired heating system.

Metal-Skinned Building

St. Louis—The first multiple-storied, metal-skinned building to be erected under provisions of the city's recently amended building code will be a three-story warehouse and office.

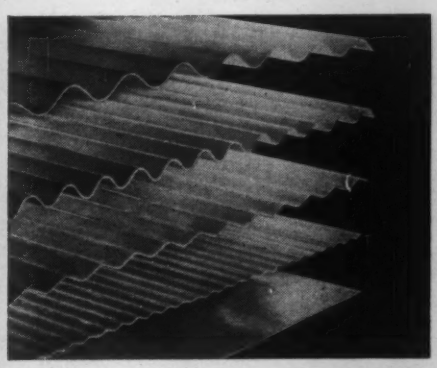
The project, to be built for Brown Shoes Co., will have 454,000 sq ft of floor space. An enclosed trailer dock will handle 30 trailers, and a railway switch will take care of eight cars at a time.

Your plant windows will never have to take this "torture test"



NEW FIRE-RESISTANT PLASTIC makes possible rugged, shatterproof translucent glass fiber panels for plant windows, skylights, partitions, stair wells. Blowtorch flame blackens this window panel, but doesn't make it burn freely. See how burning stops when the flame is removed. Panel contains HETRON®, a new resin that doesn't support fire.

IF YOUR BUILDING CODE calls for a flame spread rating under 75 you can meet the requirement with a HETRON-based panel. You can get panels with ratings of 75, and lower—equivalent to the Building Officials Conference of America classification of "slow burning" or "flame retardant."



YOU CAN SELECT rugged, nonshattering, fire-resistant sheets made with HETRON, in a full range of sizes, gauges, colors; corrugated or flat; translucent or opaque. We'll be glad to tell you which sheet-makers can supply you. Write also for test data and pictures, plus descriptive information on HETRON resins.

HETRON is made by Hooker

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SIGN COSTS DROPPED WHEN THESE CITIES AND STATES SWITCHED TO ALCOA® ALUMINUM

You make significant savings right off the bat when you switch to Alcoa Aluminum for your highway signs and markers. It weighs only half as much as steel, so less time and effort are needed for shipping, handling and erection. Yet it's equal to every demand for strength because Alcoa Aluminum alloys withstand wind loading in excess of 100 miles per hour.

But the greatest savings come in lower maintenance costs, resulting from resistance to corrosion. When vandalism or accidental damage punctures the message film of a steel sign, only prompt and costly repairs can halt progressive rusting that destroys legibility and soon reduces the sign to scrap. But corrosion-resistant Alcoa Aluminum signs stay on the job no matter how long repairs are postponed.

In 21 states besides those we've named, and in scores of cities and counties, aluminum's capacity for cutting costs has made it a standard sign material. Your Alcoa Distributor can help you save as they do. He stocks aluminum sign blanks in a wide range of standard shapes and sizes. He can furnish aluminum sheet if you shear your own blanks. And he carries a complete line of Alcoa Aluminum Fasteners for trouble-free installations. If you require special counsel on fabrication or finishing, whether for painted, enameled or reflectorized signs, your local Alcoa sales engineer is as easy to reach as your telephone. ALUMINUM COMPANY OF AMERICA, 1977-D Alcoa Building, Pittsburgh 19, Pa.

Specifications for Alcoa standard sign blanks

Thickness	Width (Hor.)	Length (Vert.)	wt/pc	Thickness	Size	wt/pc
.064" x	12" x	18"	1.34#	.064 x 18"	Octagon	1.72#
.081" x	18" x	24"	3.40	.081 x 24"	Octagon	3.75
.081" x	24" x	30"	5.66	.081 x 30"	Octagon	5.85
.081" x	36" x	12"	3.43	.081 x 24" x 24"	Diamond	4.57
.081" x	30" dia. x		5.57	.081 x 30" x 30"	Diamond	7.08

All blanks fabricated from Alloy 6061-T6 flat sheet with two 3/8" mounting holes. All sizes except octagon have rounded corners with 1/2" radius. Alodized finish applied after blanking and punching insures full coverage. Packaged 10 per carton.

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Atlanta 3, Georgia
J. M. Tull Metal & Supply Co., Inc.
Baltimore 5, Maryland
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Birmingham, Alabama
Hinkle Supply Company
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Brace-Mueller-Huntley, Inc.
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Whitehead Metal Products Co., Inc.
Cambridge 39, Mass.
Whitehead Metal Products Co., Inc.
Charlotte 6, North Carolina
Edgcomb Steel Company
Chicago 80, Illinois
Central Steel & Wire Co.
Chicago 23, Illinois
Steel Sales Corporation
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Corey Steel Company
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Miller Steel Co.
Houston 3, Texas
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Indianapolis 18, Indiana
Steel Sales Company of Indiana, Inc.
Jacksonville, Florida
Florida Metals, Inc.
Kansas City, North, Missouri
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Whitehead Metal Products Co., Inc.
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Portland 9, Oregon
Pacific Metal Company
Rochester 1, New York
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Metal Goods Corporation
Salt Lake City 4, Utah
Pacific Metals Company, Ltd.
San Diego, California
Ducommun Metals & Supply Co.
San Diego, California
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San Francisco 10, California
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ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

On Main Street, or in the wild upper peninsula, you need the "Big 3"

There's a big copper refining plant on the shores of Lake Superior, near Ontonagon, Michigan.

They use a lot of water.

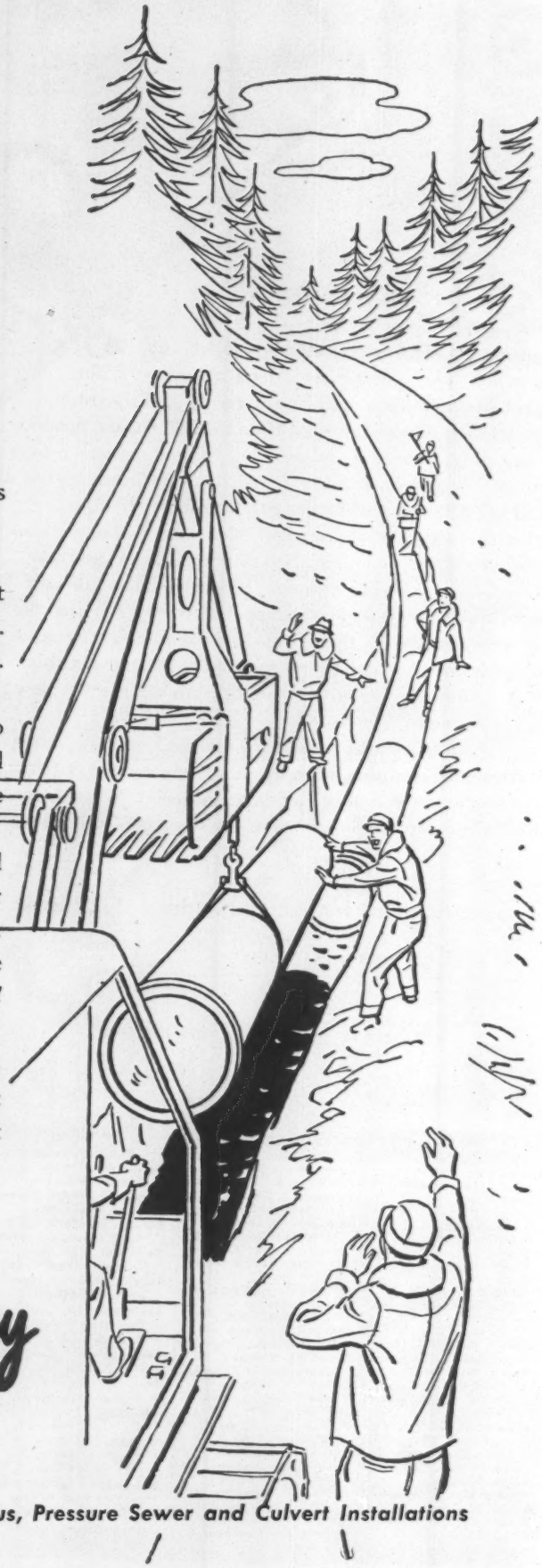
They wanted a *trouble-free* water line . . . one that would be as *nearly ageless* as man could devise . . . one with *great strength* to resist earth loadings . . . one with *sustained high capacity.*

These "Big 3" requirements were important to the White Pine Mining Company—so they specified Price Prestressed Pipe for a new 25,000 foot line of 36-inch pipe.

The same "Big 3" requirements were recognized by Miami, Louisville, Cleveland and many other cities large and small. Now they use Price Pipe.

You, too, need a pipe line that meets *all* 3 of the "Big 3"... *long life, great strength* and *sustained capacity.* Don't be satisfied with less.

Before you specify your new water supply line, call in our engineers. They'll show you how to get a trouble-free line of ageless concrete at the lowest possible cost.



Price Brothers Company

1842 East Monument Ave., Dayton 1, Ohio

Member American Concrete Pressure Pipe Association

Concrete Pressure Pipe for Water Supply, Subaqueous, Pressure Sewer and Culvert Installations

FIRST STEP—Corrugated steel flooring is placed on new steel stringers to replace timber decking formerly carried by structure spanning the New York Barge Canal.

FINISH—Partially repaved, crossing looks like this with floor plate corrugations filled with asphaltic concrete. Application of final wearing course awaits warmer weather.

Resurfacing a City Street That's Also World's Widest Bridge

Engineers insist that the structure on Main Street in the City of Lockport, N. Y., is a bridge—the widest in the world. And it is in fact a framing of 3-hinged steel arch girders and transverse floorbeams that carry a decking over the New York State Barge Canal. On this structure is accommodated a 400 ft long section of Main St., which is also a part of New York State Route 31.

The problem confronting Charles R. Waters, New York State District Engineer at Buffalo, and his assistants, was to replace the worn wood block paving on the "bridge" as cheaply as possible and with little interference to sometimes heavy local and through traffic.

In recent years, despite repeated temporary repairs, the old floor had gradually worsened to the extent that a new deck was necessary for safety.

• **Investigation**—The spacing of the steel arches is variable, ranging from 7 ft 6 in. to 13 ft 6 in. Twelve-in. floorbeams, also with variable spacing from 1 ft 10 in. to 2 ft 7 in., had been placed transverse to the arches, and carried nailing strips to which a 3¾ in. plank floor and a 3-in. wood block wearing course were fastened.

The principal structural members of the bridge were found to be sound and capable of carrying legal loads.

• **Solution**—Engineers decided that their answer lay in the use of a structural plate bridge flooring covered with bituminous concrete, but due to lack of funds, only a portion of the bridge deck could be so rebuilt.

Since most of the traffic is in an east-west direction, it was decided to use the limited funds for a liberal four-lane traffic width extending, in this case, diagonally across the bridge a distance of about 250 ft for a total of 18,314 sq ft. (While the span of the arches is in the neighborhood of 120 ft, due to considerable skew of Main Street with the Barge Canal and adjacent street layout, the bridge is nearly 400 ft wide.)

• **Construction**—Upon removing the old wooden decking and nailing strips, the contractors found, as expected, extensive corrosion of the 12-in. floorbeams, the end dams and the top flanges of the steel arches.

The arches and beams were thoroughly cleaned and painted, and the end dams, which were in an unsatisfactory condition from repeated heavy traffic impact, were repaired. In many instances it was found necessary to weld variable thickness shims to the top flanges of the floorbeams.

New 10-in. stringers were welded to the floorbeams to afford uniform bearing for the 7-ga., 2 in. deep corrugated steel flooring, which was supplied in 30-ft maximum lengths and a nominal laying width of 24 in. Oval welding holes ¾ in. x 1¼ in. were provided in the valley of every corrugation at every stringer. Similar holes for drainage were provided in the valley of each corrugation at the quarter point between stringers.

Prior to installation, the plates were laid bottom up and given two coats of black paint, thus eliminating overhead painting after installation. The plates were welded to the stringers with two ⅛ in. x 1 in. fillet welds at every corrugation and every stringer, and plates were also joined at the edges by lapping. The edges of adjacent plates were joined with a weld 3 in. long midway between each pair of stringers.

• **Paving**—Upon completion of the plate installation, but before placing the bituminous concrete, the entire top of the structural plate flooring was given a coating of asphalt emulsion at the rate of 0.15 gal per sq yd.

Following this application the first of two courses of New York State specification Item 52 MX-asphalt concrete was placed in such quantity that after compaction by rolling the valley corrugations were completely and densely filled. Due to the lateness of the season, completion of the pavement has been delayed until warmer weather.

• **Credits**—The contract bid price for the entire work was $88,330. Contractor was Hendrich Construction Co., Inc., of Buffalo, the bid price for the structural plate was $2.40 per sq ft and about $0.16 per sq ft for the bituminous material—a total of $2.56 per sq ft for the replaced floor proper.

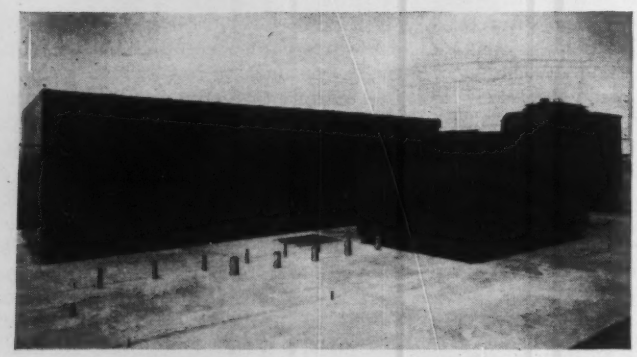
The work was done under the direction of Mr. Waters, with A. L. Miller in charge of design, F. J. Fuller, supervising engineer and G. L. Tolsma, project engineer.

The corrugated flooring was fabricated and furnished by United Steel Fabricators, Inc., Wooster, Ohio.

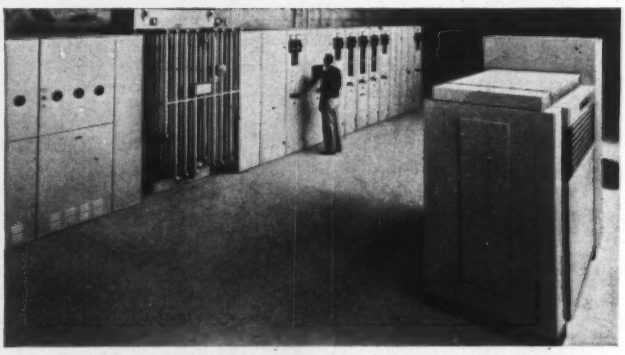
ENGINEERING
REPORTS:

MORE NON-GLARE LIGHT per watt is provided for the airport's 4500-car parking lot and its approaches by 232 G-E luminaires.

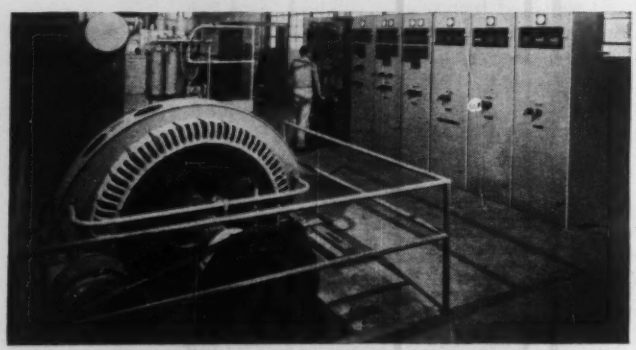
G-E power system permits easy future



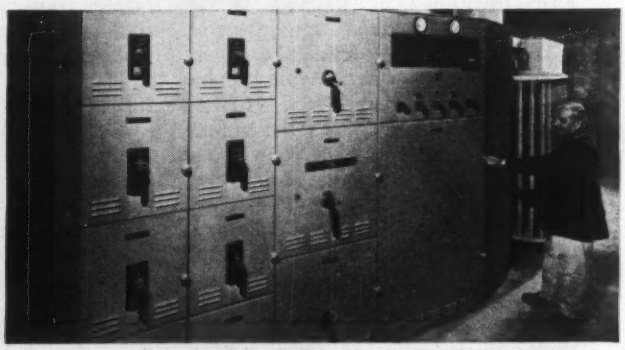
EASILY ACCESSIBLE, yet fully sheltered, this outdoor installation of the main 12-kv switchgear and one master unit substation is readily expandable. Note conduit placed for future units.



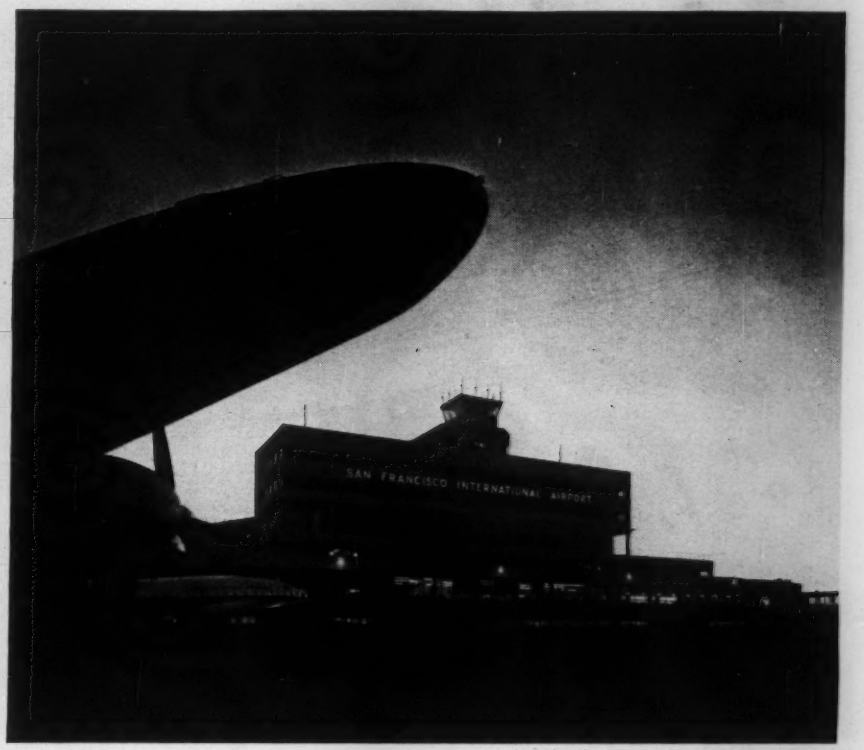
MORE EFFICIENT higher-voltage distribution of power is provided close to load by G-E indoor master unit substation (left) and integral distribution center substations (right).



EXTRA POWER RELIABILITY for airport is provided by standby, diesel-driven, G-E generator. Metal-clad switchgear, right, dependably protects vital radar, runway and approach lights.



GREATEST FLEXIBILITY of distribution and convenience of operation is achieved with G-E load center unit substations. Above is one of two substations furnishing power for terminal.



EASY EXPANSION FEATURES were planned to anticipate 5000-kva load by 1960.

expansion at new San Francisco airport

"Building-block" flexibility provides for adding capacity as needed, keeps present system costs low

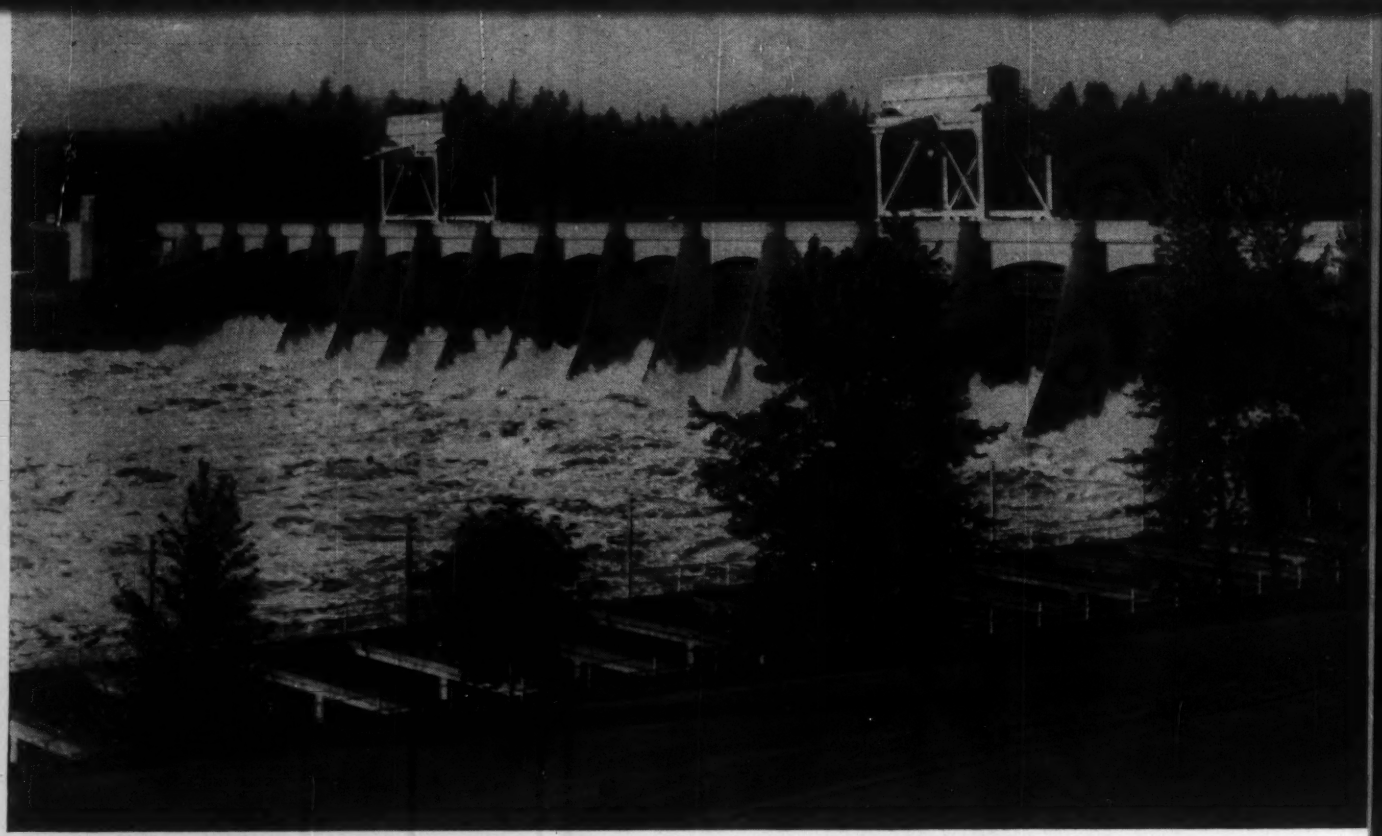
San Francisco's great new International Airport handles more than two and a half million passengers each year, could handle twice that number now with no strain—and can expand at minimum cost to ten million capacity whenever necessary. A major factor in the airport's ability to expand is the highly flexible, efficient electrical system serving it.

Electrically, the airport is a model of modern system design and farsighted planning. General Electric engineers worked with San Francisco Public Utilities engineers in designing the electrical system for the airport itself, and with Clyde E. Bentley, consulting engineer with associates, on the system for the terminal building. The building was designed by W. P. Day, San Francisco, architect and structural engineer for the project. G-E 1500-kva master unit substations were used as key "building blocks." Initial system investment was kept low, yet future demands planned for, by this provision for adding small blocks of power capacity only as more power is needed.

Years of engineering experience and skill were made available by G.E. to the customer, consulting engineers, architect, and electrical contractor Abbett Electric Corporation of San Francisco. When planning installed equipment or electrification of tools for heavy construction projects remember G-E equipment is backed by G-E engineering help in application, installation and service. This help is available to you through any G-E Apparatus Sales Office, or by writing General Electric Co., Section 664-35, Schenectady, N. Y.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC



WATER SURGING through Bonneville Dam's spillway for 17 years has resulted in extensive concrete erosion.

Bonneville Dam Spillway Erosion Repaired

Donald H. Basgen
Construction Engineer
Portland District
Corps of Engineers

Extensive repairs of the south half of the Bonneville Dam stilling basin have just been completed. The $705,000 job was necessitated by gradual concrete erosion over large areas of the stilling basin baffles and floor and by downstream riverbed scour.

Work inside a steel cellular cofferdam could only be carried out during the Columbia River's low flow period. This meant three shift wintertime operations.

Designed changes were made to improve characteristics of the stilling basin jet and minimize negative pressures. And concrete with maximum cavitation erosion resistance was installed.

Bonneville Dam, completed in 1937, has a 1,070-ft long spillway divided by 17 piers 10 ft wide into 18 bays 50 ft wide controlled by vertical lift gates. Columbia River flow at Bonneville (63 years' record) ranges from 35,000 to 1,170,000 cfs with a mean annual flow of 211,000 cfs. Normally the spillway is in operation from April to August each year when the snow melt run-off raises river flows above the 130,000 cfs maximum demand of the ten 74,000 hp powerhouse turbines. Average maximum daily flow during this period is 585,000 cfs.

Designers of Bonneville anticipated the probability of repairs of the baffles and baffle deck possibly at 15-year intervals. Some repairs were made before construction was completed. This was to remedy erosion resulting from leaving seven spillway bays low. Spillway and pier faces were resurfaced with gunite. Baffles and deck, although known to be somewhat eroded, were not repaired at that time. And periodic diver examination showed slow but progressive deterioration of the baffles and deck.

Small scale repairs were made in 1942 and 1947 with a total of 12 baffles and the deck in one bay resurfaced, using a 32x30-ft caisson. In this operation one baffle was completely armored with $\frac{3}{8}$-in. steel plate anchored with bolts at 12-in. centers. Two of the baffles were restored to the original design dimensions and nine were constructed with 9-in. radius on each leading edge and a $2\frac{1}{2}$-ft radius connecting top and back slope.

Subsequent surveys show that these revisions noticeably reduced cavitation erosion on the baffles, but did not decrease the extent or severity of damage to the deck downstream of the baffles. The armour plating was completely removed by the water.

Surveys of channel conditions downstream from the apron showed continuing changes in riverbed elevations. At times the rock had scoured as much as 10 ft deep and then at a later date

BEFORE—Stilling basin had two rows of baffles. Repairs were made to south half

EROSION of stilling basin baffles had reached an advance stage as indicated here.

Relative Resistance of Concrete to Cavitation Erosion

Surface Treatment	Relative Resistance
Steel Form	1
Plywood Form, sand blasted and ground with 1:2 mortar at 7 days ground smooth at 28 days	1.1
Wood float finish, ground smooth at 28 days	1.7
Plywood Form	2.1
Steel trowel finish	2.6
Vacuum mat—smoothed off by steel trowel	3.3
1/2 in. absorptive form lining	7.4
3/16 in. metallic aggregate topping	8.7

Note: Resistance is a comparison of cubic inches eroded in 16 hours exposure in cavitation test machine—except metallic aggregate samples were exposed for 56 hours. Concrete had 0.31 water cement ratio, 1-in. slump and 4,460 psi 7 day compressive strength. Tests made at about 70 day age.

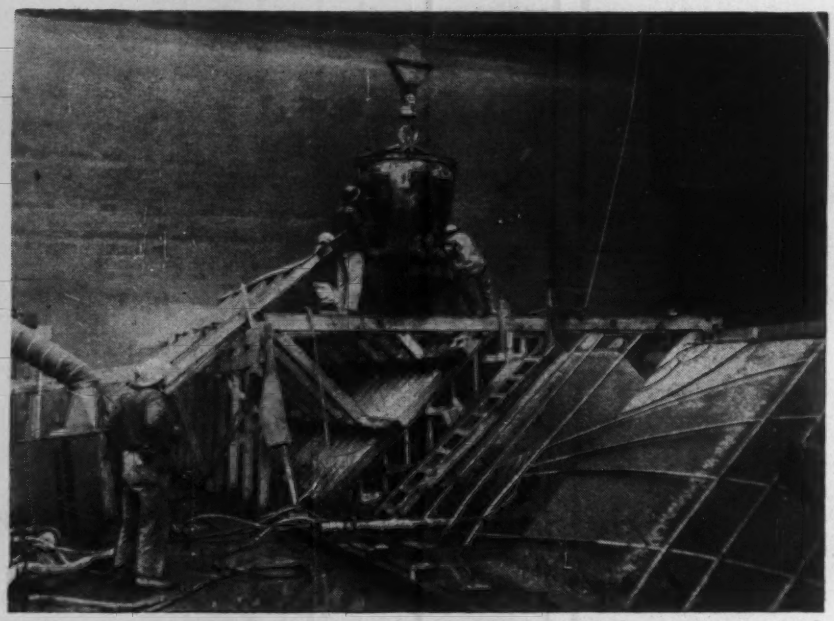
had filled in as much as 9 ft above the original level. Some undercutting of the downstream edge of the apron was found.

Extent of the erosion was fully seen when the stilling basin was dewatered for the current work. Damage to the gunite surface of the spillway generally originated at bearing plates embedded in the surface during construction. Loss of most of the ½x24x36-in. plates enabled the water to peel off large areas of the surface downstream from the plates on the spillway and bucket. The depth of erosion on the baffle deck varied from ½ to 22 in. Maximum erosion of the deck occurred downstream from each baffle, probably the result of cavitation around the downstream corners of the baffles.

Maximum erosion of the baffles, the effect of cavitation, occurred on the sides up to 22 in. depth. Generally, damage to the upstream row of baffles was much more severe extensive than that to the downstream

of spillway during 1954-55 low flow season. Cofferdam protects working area.

AFTER—Second row of baffles was converted to solid end sill and extra concrete was added to first row. Canopy in background permits winter concreting.



FORMS FOR BAFFLE REPAIRS were heavily trussed as tie rods were not permitted. Reason is that even slight imperfections in concrete surface might get new erosion started.

row. But the pattern was similar. And there was evidence that debris such as large trees and logs took their toll in damage to the baffles.

In planning the repair work numerous model studies were made in the Bonneville Hydraulic Laboratory using a 1:36 scale model of the stilling basin. Various combinations of baffle designs with and without end sill were investigated to develop a stilling basin that would reduce scour of the riverbed and improve pressure conditions on the baffles to minimize cavitation. For economical and structural reasons no change in the length of the baffle deck and the baffle locations was considered. In the original design (2 rows of baffles) conventional stilling basin action was necessary to dissipate the energy jet at lower river flows (400,000 cfs and under). However, because of the short baffle deck and the close proximity of the baffles to the bucket, damaging low pressures occur on the baffles. With a 400,000-cfs flow a small decrease in tail water elevation (2.3 ft) produced a minimum pressure of −20 ft on a baffle. At higher flows baffle pressures are no longer critical. But the excessive tail water depth and short basin length requires that the stilling basin act as a bucket to deflect the high velocity jet away from the riverbed. The original design allowed the jet to strike the bed near the apron.

The model tests indicated the desirability of deflecting rather than abruptly stopping the jet. So in the revised design the upstream row of baffles retained the sloping face of the original design, but were increased in width with the leading edges rounded to an eliptical curve. And intersection of the top and back face of the baffles was curved.

To obtain the indicated improved stilling basin action provided by an end sill with a minimum expenditure of funds, the second row of baffles was revised to a solid sill of similar section.

With the revised design, baffle pressures are higher and critical tailwater elevations lower than with the original design. Flow conditions downstream of the stilling basin will be improved with the area of jet impingement moved approximately 200 ft downstream from the apron.

• **Concrete surfaces improved**—An attempt was made to produce concrete surfaces having the greatest resistance to cavitation erosion. Tests show conclusively that low water-cement ratio produces the best concrete for this purpose. Consequently, concrete for the repair was designed with the low water cement ratio of .32. Concrete had 1½ in. maximum sized aggregate, a cement factor of 9 sacks per cubic yard and a slump of from 2 to 3½ in. The compressive strength of this concrete averaged 5,000 psi at seven days and 6,500 psi at 28 days with 90-day strength expected to exceed 10,000 psi.

Earlier tests conducted by the Bureau of Reclamation indicated special surface treatment further increased cavitation erosion resistance. Several specimens having different surface treatments were cast and tested in the Bureau's cavitation testing machine in Denver. An accompanying table shows results of these tests.

The use of absorptive form lining for all baffle faces was adopted for obvious reasons as was the metallic aggregate finish on the baffle deck downstream of the baffles where cavitation tendencies are greatest. For the rest of the deck, where cavitation is improbable, a float finish ground smooth to expose coarse aggregate was specified. Although the laboratory tests indicated a trowel finish to be more resistant to cavitation, a ground finish was considered superior in resistance to abrasive erosion.

The baffles were given a facing of concrete having a minimum thickness of 12 in. anchored with #8 hooked bars grouted two feet into the original concrete.

The new end sill was constructed with a 12-in. minimum thickness over the original downstream baffles. And #11 anchors at 2 ft centers were grouted 6 ft into the baffle deck in the upstream face of the sill. Both faces of the sill were reinforced.

Concrete on the baffle deck, upstream of the end sill, was placed 12 in. above the original elevation. This topping was extended into the bucket to the limit of the gunite resurfacing performed during the original construction. The slab was anchored with #8 hooked bars on 3-ft centers grouted 3 ft into the original concrete. And #6 bars on 18-in. centers both ways reinforce the slab. All steel was placed with a minimum cover of six inches.

Eroded areas downstream of the end sill were filled individually. The original concrete in damaged areas was excavated when necessary to provide a 12-in. minimum thickness of patch.

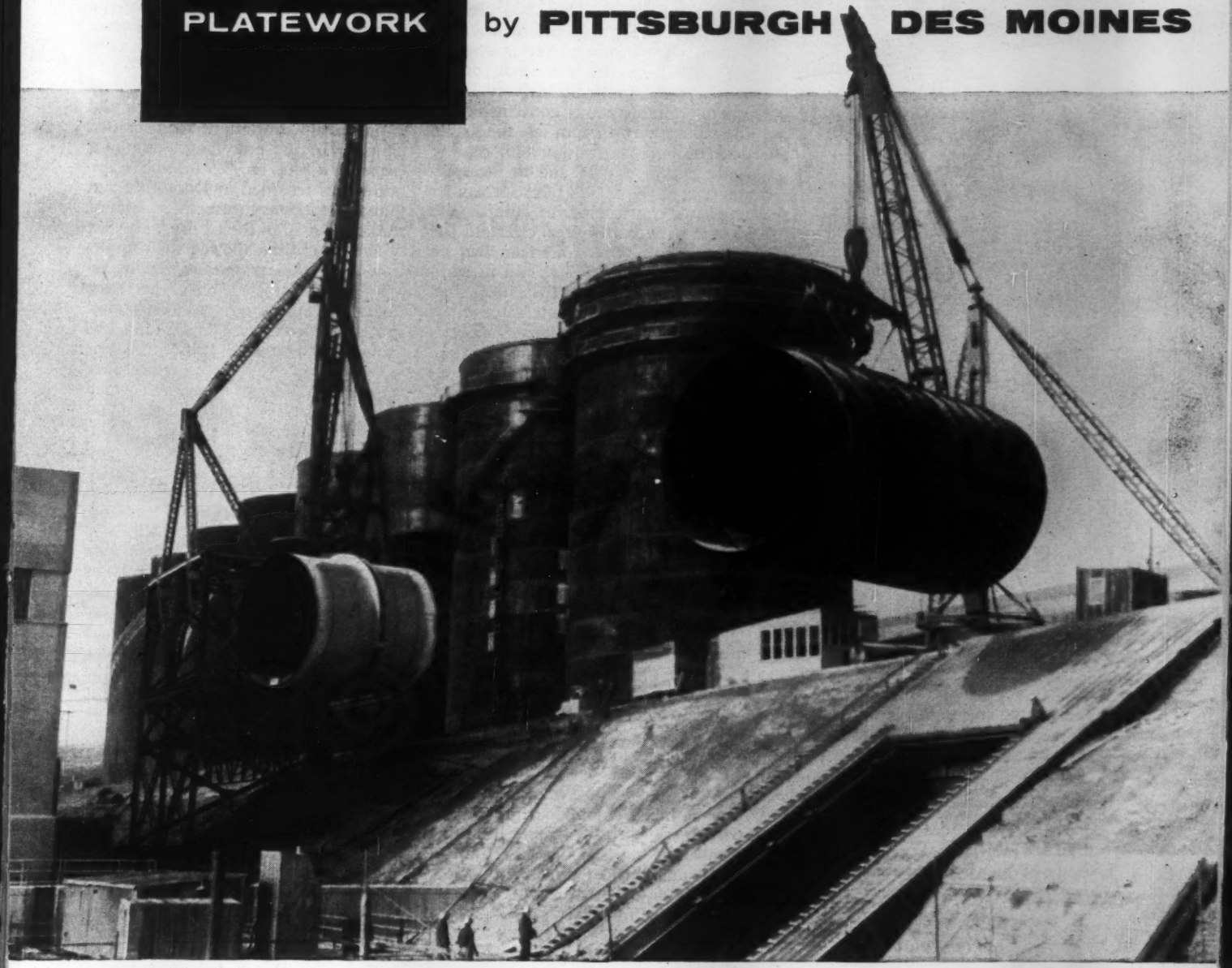
Damaged areas on the spillway and pier faces were resurfaced with gunite and ground smooth. No wire mesh reinforcing or anchors were used.

• **Work during low flow**—Work in the stilling basin had to be performed in the period of low river flows from September through March. During this period average river flows are passed through the powerhouse turbines permitting closure of the spillway. However, even in this normal low water period, spillway releases are not uncommon; consequently, the full spillway width could not be closed by a cofferdam. This condition and the limited working season available resulted in the decision to include only the south half of the spillway in the current repair contract.

Bids for the work were opened on June 10, 1954, and the contract was awarded to the Larson Construction Co. of Astoria, Ore., whose bid of $677,400 was the lowest of the 10 received. Changes and extras have raised the total contract cost to approximately $705,000. Some $240,000 of

STEEL
PLATEWORK

by **PITTSBURGH DES MOINES**



Progress Report—from **FORT RANDALL**

Our multi-million-dollar project for the Corps of Engineers at Fort Randall Dam is concerned with steel. Here in South Dakota where the Missouri is being harnessed, we are building 8 steel surge tanks 59′ diameter by 100′ high; 8 steel penstocks 22′ diameter by 700′ long; an outlet pipe 22′ diameter by 700′ long, and related work. The picture shows the surge tanks, 95% complete, and in foreground the last 50-ton penstock can being lowered into Tunnel 10. The traveler crane is about to place a 30-ton can with ring girder into Tunnel 8. ● The craftsmanship is typically Pittsburgh-Des Moines. You can count on it for your forthcoming job—may we submit quotations?

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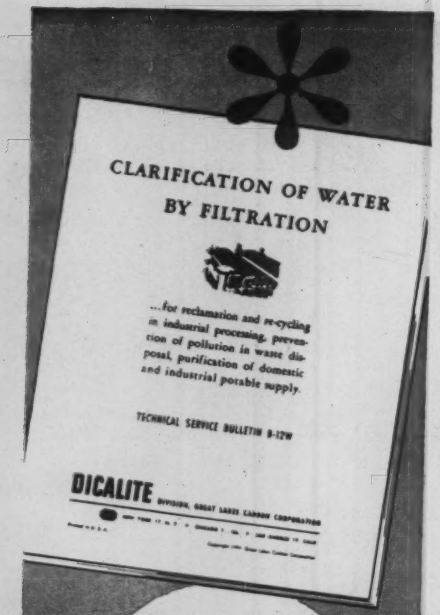
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the contract price covers the actual repair work and the balance was spent on the cofferdam. The 2000 tons of steel sheet piling required for the cofferdam were furnished the contractor without charge from a stock of recently pulled piling at McNary Dam.

The cofferdam was constructed on the apron downstream of the baffle deck, tying to a fishway wall on the south end of Bay 17 and to the spillway face in Bay 9. A 60x36-ft timber crib was constructed to furnish the closure between the steel cells and the spillway face. The cofferdam had an over-all length of 733 ft and in addition to the crib, consisted of ten steel cells—seven with a diameter of 67 ft and three with a diameter of 56 ft.

Relative high flows in the river prevented closure of the spillway gates until Sept. 21, when pile setting started. The cofferdam was unwatered on Nov. 23. Leakage through the cofferdam averaged about 12,000 gpm. Unwatering and maintenance pumping was handled by one 10,000 gpm and two 5,000 gpm turbine pumps.

Inside the cofferdam preparatory work included removal of about 3000 cu yd of concrete. Most of this concrete was removed from the sides of the baffles and in the bucket to obtain the 12 in. minimum cover of new concrete. Some was from partially eroded or otherwise unsound concrete and from sound concrete removed in trimming edges of areas to be patched. Contact edges between new and old concrete at grade were square cut with a concrete saw.

Anchor bar holes were drilled using jackhammers. Close spacing of steel, particularly in the baffles, required many false starts on holes. However, it was not considered necessary or particularly desirable to resort to the use of steel cutting rotary drills.

Forms for the baffles and end sill were unusual in that they were constructed without internal ties or bracing which were prohibited by the specifications. This restriction produced surfaces free of undesirable bolt hole patches—generally a point of weakness in surfaces subject to erosion.

The baffles and end sill were placed ahead of the deck slab and forms were tied to anchors grouted in the deck. The restricted space—12 in.—between the original concrete and the form surfaces made it necessary to place the adsorptive form lining on the form panels before they were set. Forms were stripped 16 hours after placement of concrete to permit easy and complete removal of the form lining and the greater use of the form panels.

The concrete totalling 2000 cu yd was mixed in 2 cu yd batches in truck mixers that hauled the concrete about ½ mile. The trucks discharged their loads through a near vertical 12-in. steel pipe about 25 ft long into 2-cu yd buckets on trucks running on the cofferdam. Concrete buckets were handled by a crawler crane with 60-ft boom.

Average rainfall at Bonneville Dam during the winter months is high and is practically continuous for extended periods. In the preceding season, for example, a total of 33.5 in. of precipitation was recorded in December and January with a measurable amount recorded on 50 of the 62 days. In view of the short time allowed for completion of the work provisions were necessary to permit placement of concrete under the most adverse conditions. Protection from rain (and snow) was provided by a mobile trussed canopy 62 ft square, covering the entire deck in one bay. The canopy was covered with corrugated aluminum sheets and was supported by and traveled on timber rails on top of the baffles and end sill.

Concrete for the slab was dumped from the two-yard buckets into a hopper from which it was hauled to a place under the canopy in concrete buggies. The float finishing was by hand as was the troweling of the metallic aggregate surfaced strip downstream of the baffles.

All concrete was placed at temperatures of between 50 F and 55 F and was water cured for 14 days. Curing and protection from subfreezing temperatures was facilitated by covering the surfaces with multiple layer burlap mats. Additional heat when necessary was provided by propane fired forced air heaters.

Grinding of the slab surfaces was done with a 5-hp terrazzo grinding machine using 24 and 36 grit stones successively. Grinding was started as early as six days and as late as 14 days after placement with no particular difficulty encountered at either age.

Concrete placement which started on Dec. 9 and was completed on Jan. 21 permitted cleanup well ahead of the Feb. 15 required date. Cofferdam removal is now nearly complete. The work was performed on three shifts a day, six days each week, and no delay due to the weather or river conditions was experienced after the start of cofferdam construction.

Repair work downstream from the apron—and outside of the cofferdam—covered the full width of the spillway. Tremie concrete totalling 85 cu yd was placed in four undercut areas of the apron and a total of 8,600 tons of revetment stone were placed.

The repair work was designed and constructed under the direction of Colonel James U. Moorhead, District Engineer, Portland District, Corps of Engineers.

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PORTAL TO PROGRESS—Signs like these, spaced every 12 or 15 miles along the New York State Thruway over its 427-mile length, are pointing the way to towns enjoying new spurts of industrial activity because of gateway positions on the Thruway.

New York Thruway Lures Industrial Settlers

Choice factory locations at turnpike interchanges bring an overdue economic re-awakening to Hudson west bank

Impact of the New York Thruway on communities on the hitherto economically retarded west bank of the Hudson River exemplifies the almost magical change that can be wrought in the economic pattern of an area lying in the pathway of turnpike.

As the 427-mile New York to Buffalo toll road threaded its way forward, a number of towns at interchange sites suddenly found themselves a market for industrial real estate. Queries from industries in search of rural locations with easy accessibility came pouring in.

This interest in turn stimulated a new civic optimism, which heightened as the query stage gave way to land purchases and then actual construction.

Ford Motor Co. has substantially completed a 1.6-million-sq-ft assembly plant hard against the Suffern, N. Y. interchange; Bridgeport Pressed Steel Corp. plans a lighting fixture plant at Newburgh, N. Y., and other pick-up points—approximately 15 miles apart—report great interest being displayed in all available industrial tracts.

• Kingston a typical case—Approximately half-way along the New York to Albany leg of the Thruway is Kingston, first capital of the state.

In 1900, Kingston was a thriving city, the center of the Hudson Valley cement industry, surrounded by bluestone quarries and enjoying an enviable position by virtue of direct rail and waterway links with markets hungry for its products.

Boatmen, living in Kingston and working on the waterway during the ice-free seasons, turned their efforts to harvesting ice during the winter months.

At that time Ulster County—Kingston is the county seat—boasted a population of more than 92,000.

With increased production and use of portland cement, however, most of the Kingston natural cement plants fell idle. Waterways were deprived of much of their importance through emergence of overland hauling via highways. Boatmen, relieved of summer occupations, turned to other means of providing for their families. Thus it was that while most cities were growing prior to and during World War I, Kingston's population declined, until in 1920 county residents numbered only 75,000.

It was not until 1950—under influence of World War II and post-war activity—that the county once again had reached its 1900 mark of 92,000 residents.

• Thruway's the spark—With the announcement that set the route of the New York State Thruway, there was rapid reaction in Kingston. In one four-month period, more inquiries regarding available industrial sites were received than during the preceding five years.

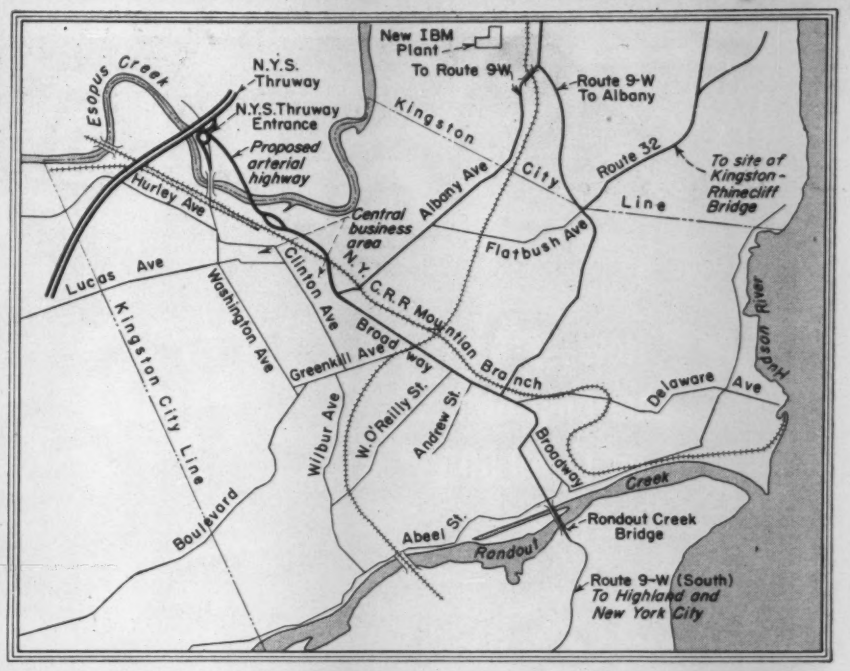
International Business Machines Corp., expressing great satisfaction with quality and availability of skilled labor in the Hudson Valley, was the first large organization to settle near Kingston. IBM bought 200 acres of industrial property north of the city in November, 1953, and now is pushing construction on a plant scheduled to open this spring. The plant ultimately will employ 5,000 workers, (and 1,500 to 2,000 initially) most of whom will be drawn from the Kingston area to supplement a core of 500-700 experienced personnel that will be transplanted from IBM's Poughkeepsie plant.

But IBM is only one of 50 corporations that have expressed interest in the city as a possible plant site.

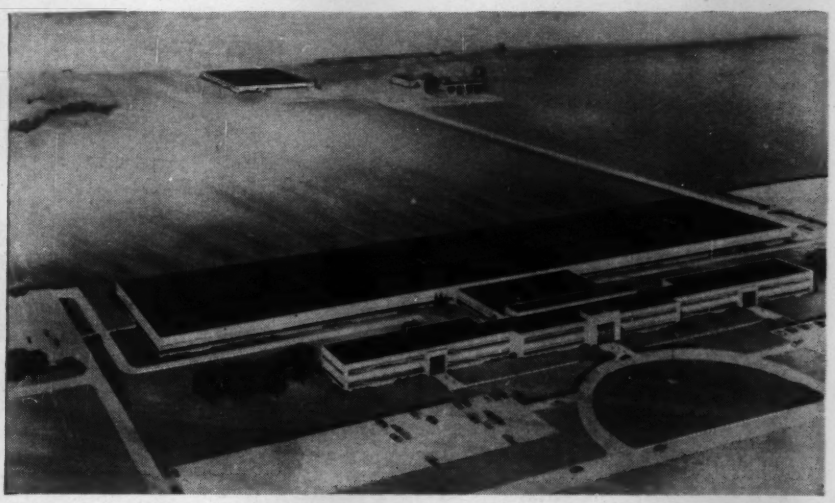
• No concessions—One important aspect of the increased tempo of activity in and around Kingston is that it has occurred without benefit of tax concessions, free utility deals or other special lures.

The city extended a 12-in. water main from its northern line to the IBM plant, and a 4-in. gas main has

FOUNDATION work is pushed on the long-sought Kingston-Rhinecliff Bridge.



WHEN THRUWAY NUDGED Kingston, a new arterial network was proposed; a Hudson River bridge emerged as reality; planning for industrial, recreational activity boomed.



INDUSTRY IS WOOED to interchange locations by ease of communications. This IBM plant will in time foster many mutual benefits—and also some mutual problems.

been taken to the plant also—at the city's expense—but these are viewed as self-liquidating investments. IBM, on the other hand, is undertaking its own waste disposal program. Esopus Creek, on the northern edge of the town, has a class "B" rating, and IBM has assured the town that its waste disposal effluent will be better than that.

Power supply may have been one of the main factors influencing the IBM decision to set up plant in Kingston. A 60,000-volt line is being run to a substation on the tract, and a unique feature of the location is that it will ultimately be served by alternate power sources. Central Hudson Gas and Electric Co. will cut the plant in on a line from its steam generator plant to the south, but there will be a secondary source to draw on from the north with hydroelectric power from the Niagara area providing full stand-by power.

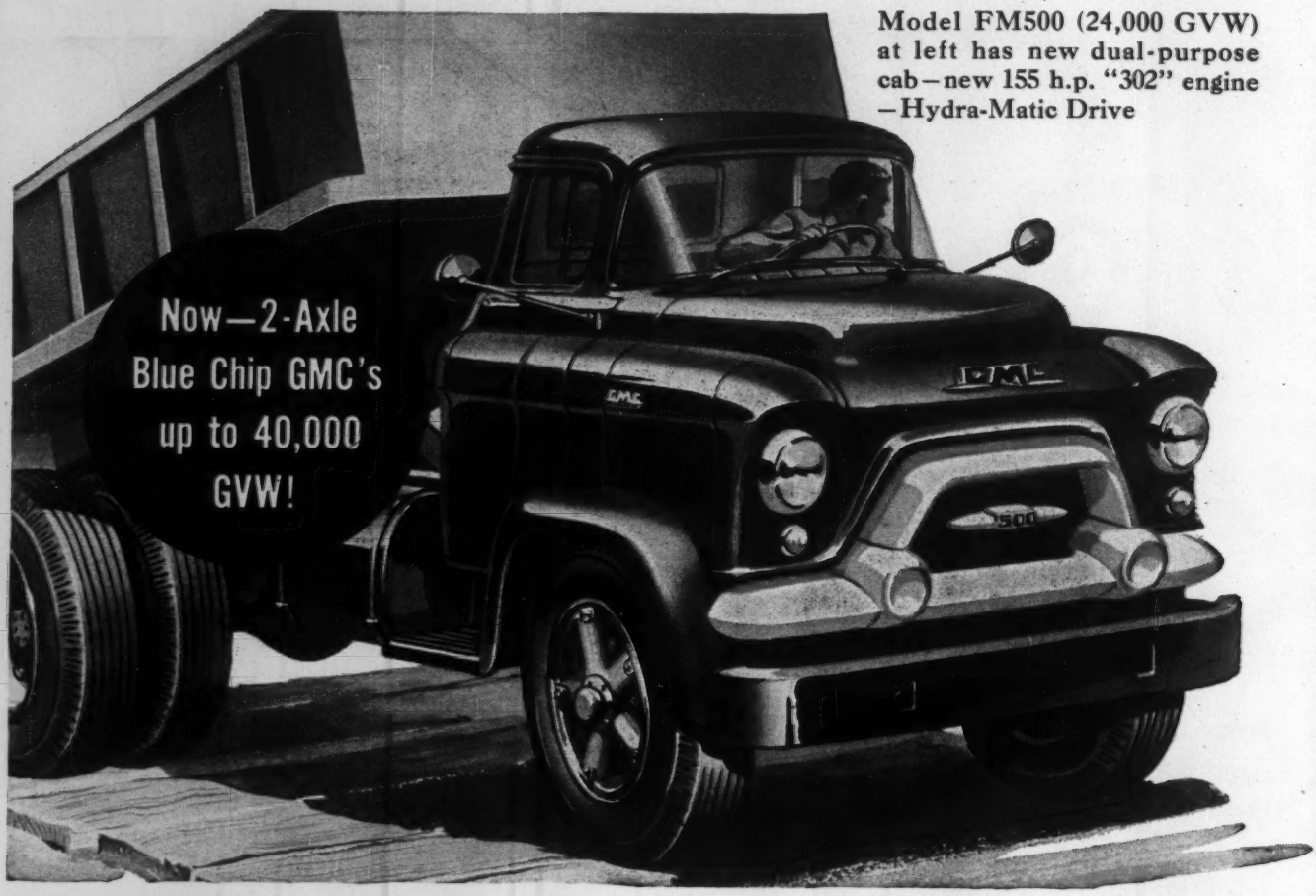
• **Other industries active**—In addition to manufacturing, trucking firms are also carrying on ambitious construction programs at Kingston. Needes Express, which had its headquarters in Kingston prior to the new era, has expanded from a 200-unit operation to 300 units. Rupp Trucking Co., of Middleton, N. Y., has built a terminal, and the Rapp Trucking Co. has established a local business.

Several other trucking firms, including a well known milk carrier, are eyeing Kingston as an outstanding terminal location.

• **Potential resort center**—The city, which has become increasingly popular as a summer resort and as a wholesale market center for the resort trade, has put in its bid for some of the winter resort business as well. The Thruway will place the state's new Belleayre Ski Lodge in nearby Catskill State Park a mere two hours drive from New York City.

On its first Saturday (it opened in December), Belleayre attracted more

(Continued on page 46)



Model FM500 (24,000 GVW) at left has new dual-purpose cab—new 155 h.p. "302" engine—Hydra-Matic Drive

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Model MW630-50 (46,000 GVW) pictured at right is Hydra-Matic equipped – has power-hiked 225 h.p. gasoline engine

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than 1,000 skiers, and on the subsequent weekends there have been as many as 2,000 on the slopes. Many of these were attracted from the New York City area even though the Thruway has not yet been completed that far south. It also took the magic of the city's proximity to a Thruway connection to force to the construction stage a 20-year plan for a Hudson River bridge that would connect Kingston with the Rhinecliff area to the east.

The $4.5-million foundation and substructure work is approximately 30% complete, and approach piers are being pushed to accommodate the superstructure whose erection is expected to get underway this summer.

The Kingston-Rhinecliff Bridge is a 7,793-ft structure—abutment to abutment—with a 36-ft roadway flanked by 2-ft walkways. Merritt-Chapman & Scott is carrying on pier operations with four barge-mounted derrick rigs.

Also approved last summer by municipal officials is a $2.78-million expressway connection between the bridge and Thruway. The link will give bypass traffic a fast route through Kingston, but at the same time the city's central business section will be accessible. The link also will tie in with a proposed arterial network within the city.

• **But problems have arisen**—Along with the advantages of rapid expansion and sudden economic activity, there are also problems to be faced. The pool of labor in the Kingston area is viewed doubtfully by many large companies due to the imminent drain of the area's labor force by IBM. True, with housing projects now under way, some new families will be attracted to the area, but the fact still remains that the city has been forced to proceed with caution in attracting new industries to the area.

Water supply may also present a limiting factor to future development. IBM has requested a peak supply of one mgd bringing the total demand on the distribution system to 7.5 mgd. Present capacity of the system is 8 mgd, which leaves very little for a cushion supply. Nevertheless the real problem is one of distribution rather than adequate supply, since additional supply mains can readily be built to New York City's Ashokan Reservoir only six miles away. However, before this is done, a proposal to install meters will be carefully studied. It is estimated that water consumption could be reduced by 30% through metering, thus making available close to 2 mgd that could be used for supplying new industry or increased population.

Adequate schools are also a problem but existing facilities are being expanded and bids have been advertised for erection of a new school this year.

Despite the problems, however, the hurdles confronting Kingston in its campaign to become once again the thriving little city of a half-century ago are minor considerations, according to city officials. Good planning, they say, and a conservative attack with continued awareness that the "wrong side of the Hudson River" is making a bid for its share of industrial expansion will go a long way toward establishing the West Bank as the right bank after all. And the Thruway is the key.

That IBM is convinced of the rebirth of the area has been made even more apparent with the company's announcement that it will build still another plant at Kingston. Ground will be broken this summer for a 322,000-sq-ft building that will take over production of electric typewriters, an operation that now is being maintained at the firms Poughkeepsie plant 20 miles downstream. Vacated space in the latter plant will be used for IBM's expanded electronic data processing machine manufacturing program.

Engineer Surveys Underway For Two Snake River Dams

The proposed Mountain Sheep and Pleasant Valley Dams on the Snake River will produce 1,025,000 kw of power instead of 800,000 kw as expected, according to Kinsey M. Robinson, president of Pacific Northwest Power Co.

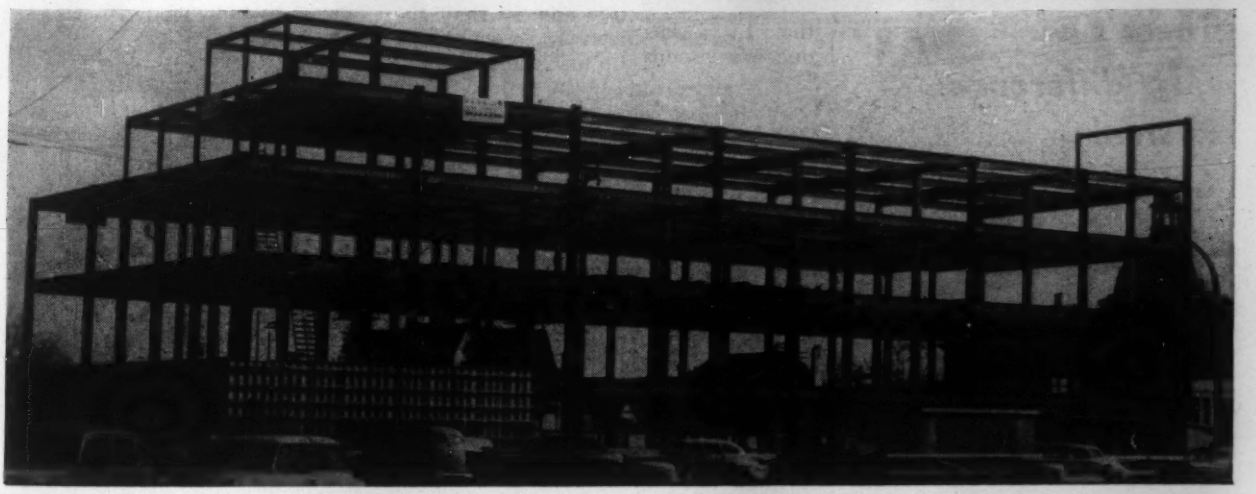
PNW, a combine of four utility companies in the Pacific Northwest, expects to apply to the Federal Power Commission by next September for a license to build the two dams. Cost of the projects, including transmission facilities, has been estimated at $200 million.

Robinson said that more than $1 million is being spent in preliminary engineering.

Surveys indicate that the Mountain Sheep Dam will be 233 ft high, producing 300,000 kw, and Pleasant Valley, 492 ft high, producing 725,000 kw. In a 20-mi. stretch of the middle Snake below Hells Canyon, the two dams will drop water 538 ft.

Engineering studies at the sites, including core drillings, are directed jointly by Bechtel Corp. and Ebasco Services, Inc. The Morrison-Knudson Co. has built access roads around the sites under permits from the U. S. Forest Service.

Part of the materials and supplies for engineering camps comes over the roads and part by diesel-powered riverboats from Lewiston, Idaho.



NEW COURTHOUSE for San Mateo County, Calif., has a four-story welded steel frame. Column-beam connections are designed for simple field welding. Joints resist earthquake forces, since all lateral loading is taken by structural frame.

Welded Steel Frame Has Simple Joints

Simple column-beam connections on an all-welded steel frame for a California courthouse reduces amount of field welding, saves on steel, and provides for full moment transfer through the columns. The building, in Redwood City, Calif., will be a Hall of Justice for San Mateo County.

The four-story structure has a penthouse and is designed for maximum earthquake loading prescribed by the Uniform Building Code of the Pacific Coast Building Officials Conference. The first to third floors are L-shaped in plan and cover an area 182x83 ft plus 92x120 ft. Later the building will be extended to 182x293 rectangular shape. The fourth story that is to serve as a jail has a 30-ft setback. Penthouse has provision for all mechanical equipment—there being no basement in the building.

Column spacing is 15 ft in the

WORKMAN WELDS beam web to shop-welded column filler plate. Beam flanges are welded to additional filler plates (arrow) that transmit moment through the column from beams in both directions.

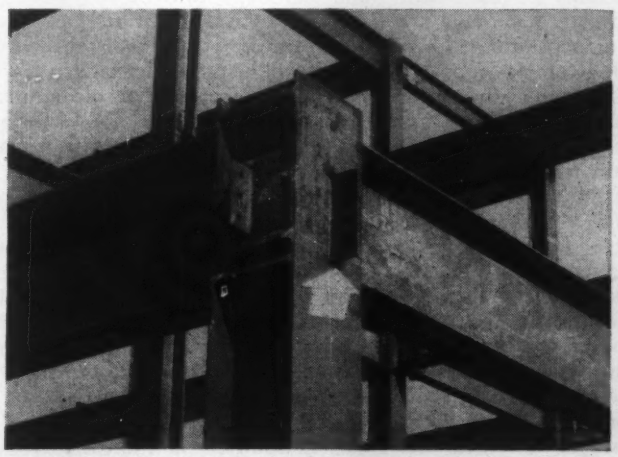
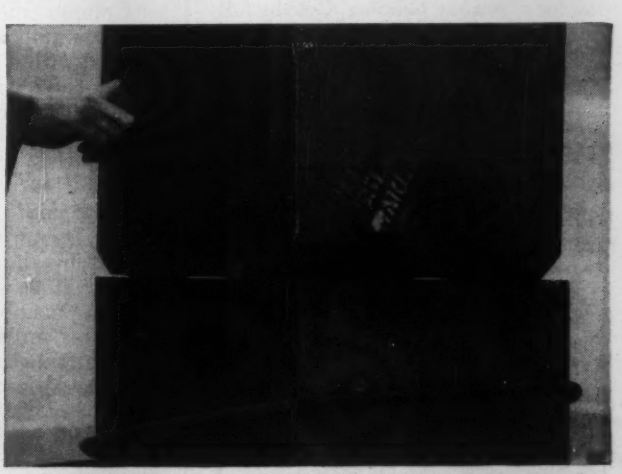


PLATE WELDED TO COLUMN serves as erection connection for beams. Plate also serves as backup plate for welding beam web to column (arrow). All welding is vertical or downhand.



COLUMN SPLICE requires full penetration weld. Members are assembled with shop-welded brackets to obtain $\frac{1}{8}$-in. root opening for column welds. Brackets are cut off later.

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transverse direction and 30 ft in the longitudinal direction. Live loading is 100 psf for the first three floors.

Main feature of the welded frame is the beam-and-column connection detail. Arrangement is such that all welding is either vertical or downhand. Shop-welded filler plates simplify field work by making it all on the outside of the column. And a saving in expensive rolled sections is effected, since the beams do not enter the columns for connection purposes.

Connections are made by bolting the webs of the beams to $\frac{3}{8}$x4 in. flats welded to the columns. These brackets later serve as backup plates for web welding. The plates are attached by single-bevel butt welds, with the welds made on the side opposite the beam position. The web is bevelled to permit a butt weld to be made to the column using the plate as a backup member. The web weld is less than 50% of the depth of the beam except in a few instances where heavy shears require greater depth of web welding. A fillet weld is placed completely around the erection plate attaching it securely to the web of the beam.

Flange connections are all welded in the downhand position, with $\frac{5}{16}$-in. thick backup strips tacked on to permit such welding. Full welded filler plates attached in the shop make the beams continuous in both directions. One set of beams is welded to the column flanges. And beams at a 90 deg angle are welded to the filler plates. Thickness of the filler plates is selected to accommodate moment from both beams. Where beams of different depths connect to the same column, two or more filler plates are installed opposite bottom flanges of the beams. Thickness of the filler plates varies from $\frac{1}{2}$ in. to $1\frac{3}{4}$ in., the latter being for the largest size girders (36 in., 300 lb WF).

Column connections are made with full penetration welds. Columns are erected with a $\frac{1}{8}$ in. separation to permit such a weld. Column tops are milled by the fabricator to assure proper length. Erection brackets are cut off after part of the flange welds are made to permit reaching the web and the inside of the flange.

All lateral force resistance is assumed by the steel frame, with the beam connections serving as moment-resisting members. There are no vertical shear walls for earthquake resistance although exterior columns will be encased in concrete (exterior finish will be a stuccoed concrete). The 6-in.-thick concrete floors act as a horizontal diaphragm to distribute horizontal load to vertical resisting members.

Foundation for the structure includes friction piles driven to predetermined length in the underlying alluvial formation. Reason for the piles is to minimize differential settlement. A foundation investigation made by Dames & Moore, soil mechanics consultants, indicated that spread footings might lead to differential settlements in excess of 2 in.

The building was designed for San Mateo County by Michael Goodman, architect of Berkeley. Structural design was by Hall, Pregnoff & Matheu of San Francisco, with design executed by Marvin A. Larson.

General contractor for the building is K. E. Parker. Structural steel subcontract is being handled by Herrick Iron Works of Oakland. Steel tonnage totals 1,185 tons with the subcontract price including inspection being $268,000, or about $225 per ton.

Total contract cost of the structure is just over $2 million, with separate contracts for pile driving, electrical, plumbing, and ventilation work.

Case Opens Facilities for Study of Cleveland Wastes

Case Institute of Technology, Cleveland, Ohio, is making its research facilities and talent available to the community by undertaking a research program on industrial waste disposal in its home area. The program is intended to produce results applicable to the entire metropolitan area.

Directing this study will be Professor George E. Barnes, head of Case's Civil Engineering and Engineering Mechanics Department and working with him will be Dr. Leon W. Weinberger, assistant professor of civil and sanitary engineering. According to Barnes, the focal point of this research project on Cleveland's industrial waste disposal will be to crystallize the city's and industry's thinking on what the objectives should be in this area.

In outlining the program, Barnes said it will be primarily concerned with the pollution potential of industrial wastes in metropolitan Cleveland and the status of industrial waste disposal in this area.

Local companies supporting and participating in this program are: the American Steel and Wire Div. of the United States Steel Corp., The Cleveland Electric Illuminating Co., Harshaw Chemical Co., Industrial Rayon Corp., Jones & Laughlin Steel Corp., Republic Steel Corp., and the Sherwin-Williams Co.

The program has been endorsed by the Committee on Industrial Wastes of the Cleveland Chamber of Commerce and the Ohio Department of Health.

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...fights corrosion...solves many piping problems

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Tube Turns offers a *complete line* of Stainless Steel Welding Fittings in three analyses: AISI Type 304, Type 347, and Type 316; and in four schedules: 5S and 10S (thin wall), and 40S and 80S (heavy wall). For the *right* stainless steel welding fittings, and for help in proper application, get in touch with your Tube Turns' Distributor. You'll find one in every principal city.

TUBE-TURN Welding Fittings and Flanges are made in U.S.A.
They meet all U.S. piping code specifications

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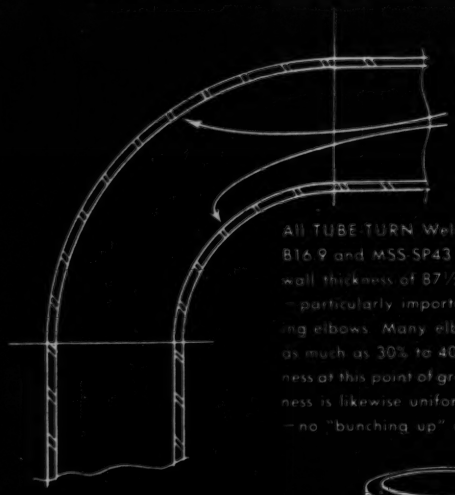
STAINLESS DATA

How you get *extra service* from TUBE-TURN* Stainless Steel Welding Fittings

EXTRA-VALUE FEATURES AT NO EXTRA COST



UNIFORM WALL ASSURES UNIFORM STRENGTH

All TUBE-TURN Welding Elbows meet ASA B16.9 and MSS-SP43 Standards on minimum wall thickness of 87½% of nominal thickness — particularly important on thin wall welding elbows. Many elbows on the market are as much as 30% to 40% below nominal thickness at this point of greatest wear. Wall thickness is likewise uniform on the inside radius — no "bunching up" of metal.

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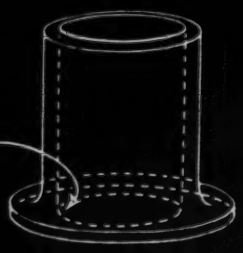
Welding Tees are adequately reinforced. Along with other TUBE-TURN Welding Fittings their strength matches the calculated bursting strength of the pipe.



NO CORROSION POCKETS

TUBE-TURN Lap Joint Stub Ends have a square inside corner which eliminates a "corrosion pocket" and a proper fillet radius which assures strength under flexing and vibration.

CHECK THESE FEATURES
Only TUBE TURNS offers them all

- **Fittings meet standard chemistry specifications**
- **Minimum wall thickness of elbows 87½% of nominal**
- **Fittings meet minimum calculated bursting pressure of matching pipe**
- **Qualified welders and procedures used where welding is required**
- **Each fitting properly solution heat treated**
- **Each fitting passivated**
- **Other special grades of stainless steel, and all other alloys available**

All these extra value features available to you at no extra cost.

MEET *ALL* CODES

TUBE-TURN Stainless Steel Welding Fittings meet all specifications: ASTM A312 (for material); MSS SP43 and ASA B16.9 (for dimensions); and MSS SP25 (marking procedure).

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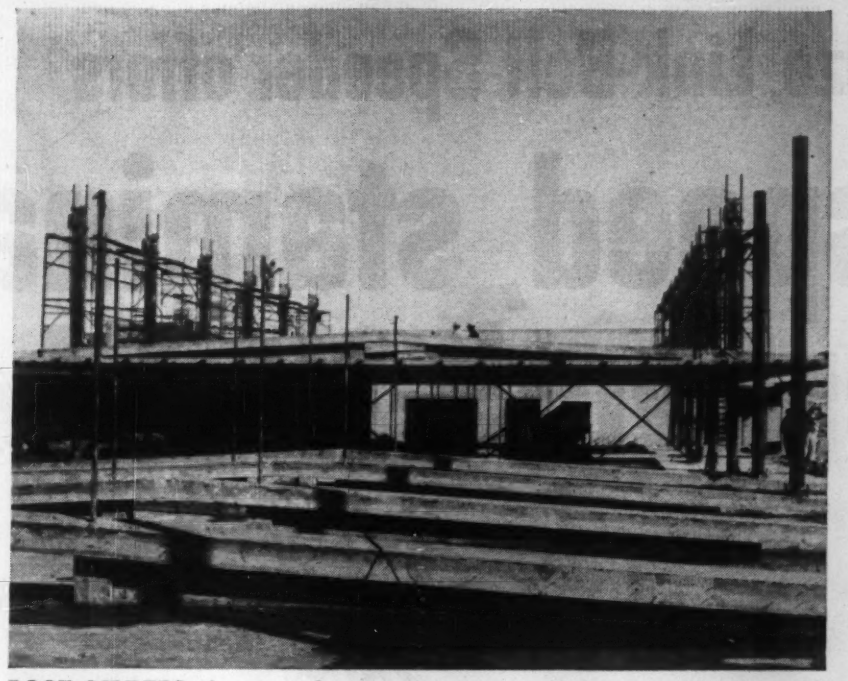


ROOF GIRDERS of prestressed concrete carry a suspended floor, making it possible to...

Span 52 ft With a 6-in. Slab

A 6-in. thick, prestressed concrete lift slab for the second floor of a new Las Vegas, Nev., hotel is carried by columns 52 ft apart and by rod hangers suspended from a girder-stiffened roof slab. Thus the ground floor of the hotel is completely free of obstructions. Both roof slab and floor slab were lifted simultaneously. The 600-ton weight of the lift makes it one of the heaviest yet.

The design requires 52x227-ft clear space on the ground floor. Columns of 8-in. standard pipe are spaced 52 ft apart on 17½-ft centers for the full 227-ft length. The second floor involves a corridor that permits use of 1¾ in. dia steel tie rods between roof and floor slab. These rods, later cast in the corridor walls, are 6 ft apart and on 17½-ft centers. The 4½ in. thick roof slab is stiffened by concrete girders on the upper side.

Prime consideration in adopting this design was economy of construction. Cost of the roof and floor slabs in place averaged only $1.35 per sq ft of area. This includes all labor and materials involved in prestressing and lifting the slabs. And the thin slabs reduce building height thus resulting in further economy.

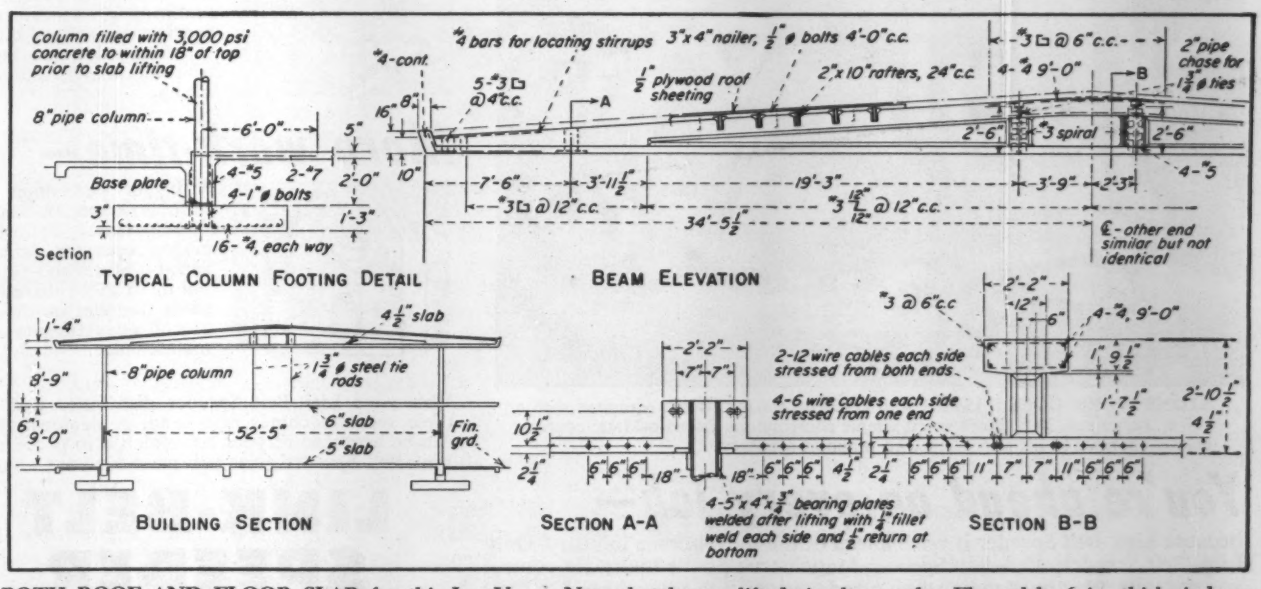
Roof and floor slabs were cast on top of each other. For lifting purposes they were split in two sections, each 101 ft long. Closing strips were cast to join the slab sections after they were in place.

• **Stress in two directions**—The 6-in. thick floor slab is prestressed in both directions. In the longitudinal direction, six wire cables are spaced 32 to 37 in. apart. Twenty-four cables are involved in the 69-ft width of the slab. Longitudinal cables are stressed from both ends.

In the transverse direction, the 6-in. slab is prestressed by 7-wire cables spaced 22 and 25 in. apart with nine cables between each pair of columns. Transverse cables are stressed from one end only. Both longitudinal and transverse cables are placed in curved positions to conform with the moment diagram of the slab. The 6 and 7-wire cables are greased and wrapped with heavy paper.

• **Roof slab**—Each roof slab is prestressed in the longitudinal direction as a continuous slab spanning between the supporting ribs. Twenty-four 6-wire cables spaced 30 to 36 in. apart serve as longitudinal reinforcement.

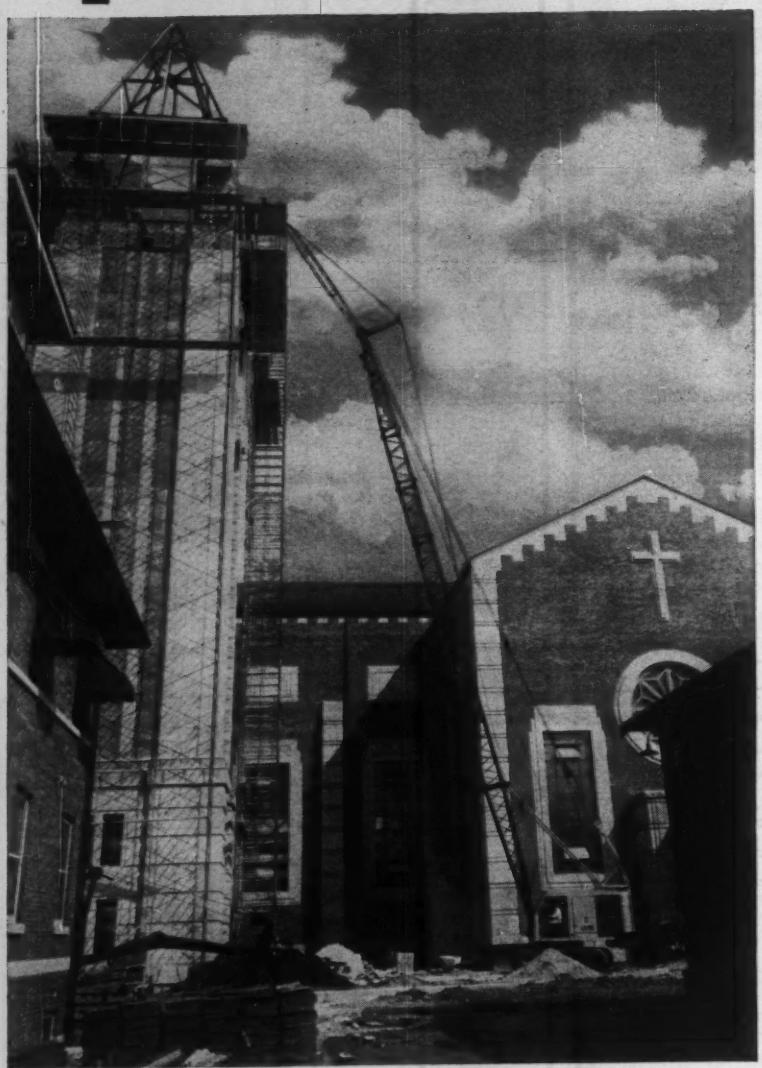
The supporting girders on the upper side of the roof slab are on 17½-ft centers. Maximum over-all depth is just under 3 ft. The girders take the



BOTH ROOF AND FLOOR SLAB for this Las Vegas, Nev., hotel were lifted simultaneously. Floor slab, 6 in. thick, is hung from roof by rods. Roof slab is 4½ in. thick but has girders on top that span 52 ft between columns.

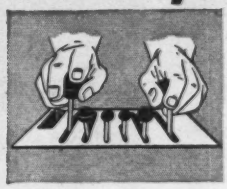
In every size, Link-Belt Speeder offers

more speed, stamina, power, work-time!



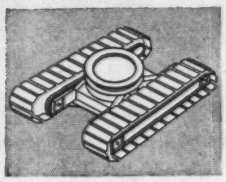
STONE WORK GOES FASTER with LS-98 on the job. Rig is equipped with a 100 ft. boom and 30 ft. jib to speed steeple construction. Speed-o-Matic controls enable operator to lift and reach with pinpoint accuracy.

More speed—



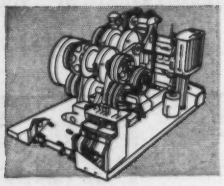
Speed-o-Matic, the true power-hydraulic control —smooth, positive response—perfect "feel" for speed with accuracy. Engineered to consider the human factor, greatly reduces operator fatigue.

More stamina—



A Link-Belt Speeder withstands continuous heavy-duty, high-speed operation. For proof, compare similar sized rigs with and without counterweights. Link-Belt Speeders have more "live weight", more strength built into every component.

More power—



Get more line pull, more digging power, lower fuel costs. Link-Belt Speeder design calls for precision-machining, anti-friction bearings and splined shafts at every point that helps transmit *rated hp* into *usable* hp.

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A bigger percentage of shift is spent in actual "work-time." By minimizing operator fatigue, Speed-o-Matic boosts output up to 25%; also eliminates frequent on-the-job clutch adjustments and maintenance.

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because Link-Belt Speeder is *years ahead* of the shovel-crane industry. Only Link-Belt Speeder offers you Speed-o-Matic's true power hydraulic control and so many other outstanding design and construction advantages. For facts on every machine in the ½ to 3-yard, 10 to 60-ton work range, contact your Link-Belt Speeder distributor. Link-Belt Speeder Corp., Cedar Rapids, Ia.

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form of tapered I-beams with the roof slab forming the lower flange. Upper flange is 2 ft 2 in. by 9½ in. Web is 6 in. thick.

In the transverse direction the roof slab prestressing cables are situated to make the thin 4½-in. slab serve as the bottom flange. Included with each beam are four 12-wire cables and eight 6-wire cables. Two additional 6-wire cables reinforce the slab between beams. The 6-wire cables are wrapped in heavy paper and greased. The 12-wire cables are grouted to provide bond.

Wires in the prestressing cables are ¼ in. dia and have an ultimate strength of 250,000 psi. They are prestressed to 150,000 psi initially, and were designed for an effective prestress of 127,000 psi.

The 1¾-in. dia tie rods between roof slab and floor slab were hung to the ribs by nuts bearing on one-inch plates. The floor slabs were held to the tie rods by 8-in. square plates, 1¼ in. thick. Since the slabs were prestressed in two directions, the diagonal tension was low. Had the slabs not been prestressed, much heavier plates would have been required.

Concrete strength was 4,000 psi for the slabs and 4,500 psi for the ribs on top of the roof slabs.

In the lifting process, the roof slabs were lifted to appropriate height above the floor slab. Then the tie rods were fixed to permit both slabs to be lifted simultaneously. Bracing was installed between the two slabs to prevent lateral movement during lifting.

The lifting system included an electronic control mechanism devised to keep the slab level at all columns. Whenever the slab at one column is lifted out of level by ¼ in. the jack at the column automatically stops. It then waits until all other jacks catch up with it and then starts again automatically.

Capacity of the jacks was 50 tons each. And the jacks were worked to full capacity with 12 columns serving each of the 600-ton lifts. As a further safety factor the 8-in. standard pipe columns were filled with 4,000 psi concrete. And the bases of the columns were fixed to resist lateral forces during lifting. Lifting speed was 4.5 ft per hour.

• **Credits** – General contractor for Tony Cornero's Stardust Hotel, Inc., was Donald R. Patterson, Los Angeles and Las Vegas. Contractor for prestressing and lifting was Western Concrete Structures Co., Los Angeles. Consulting engineer was Prof. T. Y. Lin of the University of California with E. K. Rice as project engineer. Architectural design was by Jack McCallum.

SUB CLEANING—New marine railway drydock houses Navy submarine while workers prepare for maintenance of vessel.

Drydock Makes It Easy

Built to handle fleet-type Navy submarines with the greatest possible efficiency, an unusually equipped marine railway-drydock is now in service at Groton, Conn.

Crandall Dry Dock Engineers, Inc., of Cambridge, Mass., designed the structure for the Electric Boat Division of General Dynamics Corp., to include at least four unusual features for fast, efficient operation:

• The 2,500 long-ton dock rides on an underwater track built entirely of greenheart, and supported on greenheart piling.

• The cradle, which has an all-welded steel frame, is divided into two sections for self-docking and maintenance.

• The dock is equipped with a flush cradle deck, sealed to protect the ways during sandblasting operations.

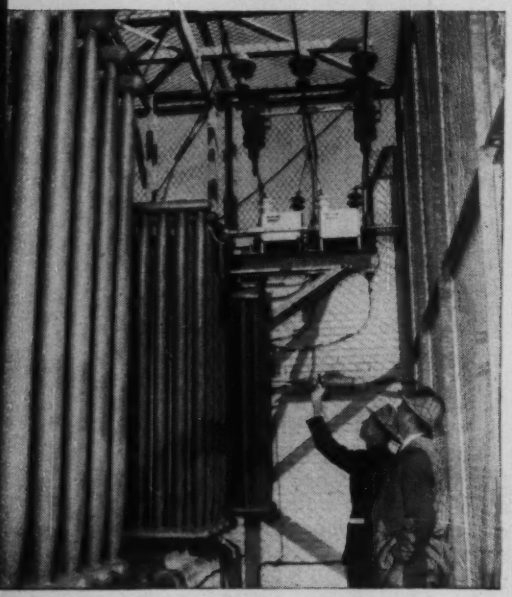
• Only one wingwall is provided—leaving the port side of the dock clear for handling large, heavy replacement parts. Twelve special keel blocks are activated by winches mounted on this single starboard wall.

• **Details**—The dock itself has an overall length of 330 ft, including a 40 ft long forward section and a 30 ft long fantail. The 260 ft section over the keel blocks has a clear width of 56 ft.

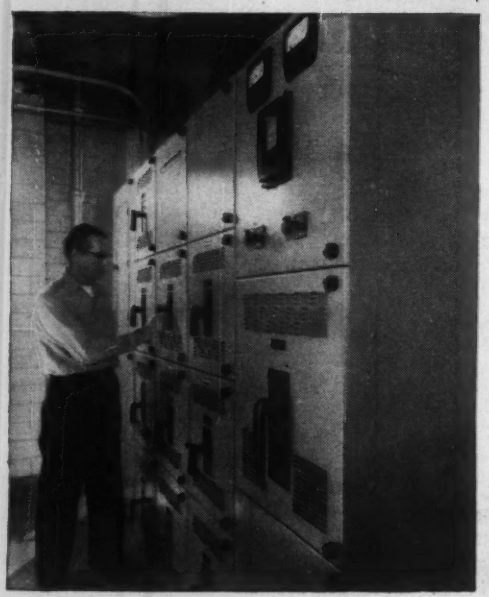
Power is supplied by a 375 hp electric motor, the cradle travelling on a system of free rollers pulled by four cast-steel hauling chains. Capacity vessels can be hauled in less than 20 minutes.

Total length of the timber track is 670 ft., with an additional 100 ft of concrete track provided on inshore end of the railway. Track grade is 6%.

LITTLE MIAMI SEWAGE TREATMENT PLANT
—first step in Cincinnati, Ohio's program to provide modern sewage treatment and disposal facilities. Consulting Engrs.: Havens and Emerson. Gen. Contractor: James McHugh Constr. Co., Inc.



FACT: Reliable electrical service starts at this city-owned substation, adjacent to the plant. Three 333-kva, single-phase Westinghouse transformers step down utility power from 13.2 kv to 480 volts.



FACT: Service continuity on the entire electrical system stems from this Westinghouse switchboard, distributing at 480 volts. Air circuit breakers protect the main circuit and 10 branch feeders.

FACT: Westinghouse "De-ion®" circuit breaker panelboards at key distribution points protect plant's services. Westinghouse dry-type transformer, top, reduces voltage for lighting and instruments.

FACT:

Westinghouse distribution equipment serves Cincinnati's new sewage treatment plant

ELECTRICAL SYSTEM DESIGNED TO MATCH LITTLE MIAMI PLANT'S ULTIMATE CAPACITY OF 30,000,000 GALLONS A DAY

FACT: Dependable power in Cincinnati's Little Miami Sewage Treatment Plant is assured by a coordinated installation of three 333-kva transformers, a 480-volt switchboard, lighting and power panelboards, dry-type transformers and motor control . . . all matched for operating simplicity and plant efficiency.

FACT: Positive protection of valuable equipment is provided by using Westinghouse circuit breakers throughout the distribution system . . . and circuit breakers are safe.

For the full case history and the Westinghouse team that helped coordinate it electrically . . .

J-94034

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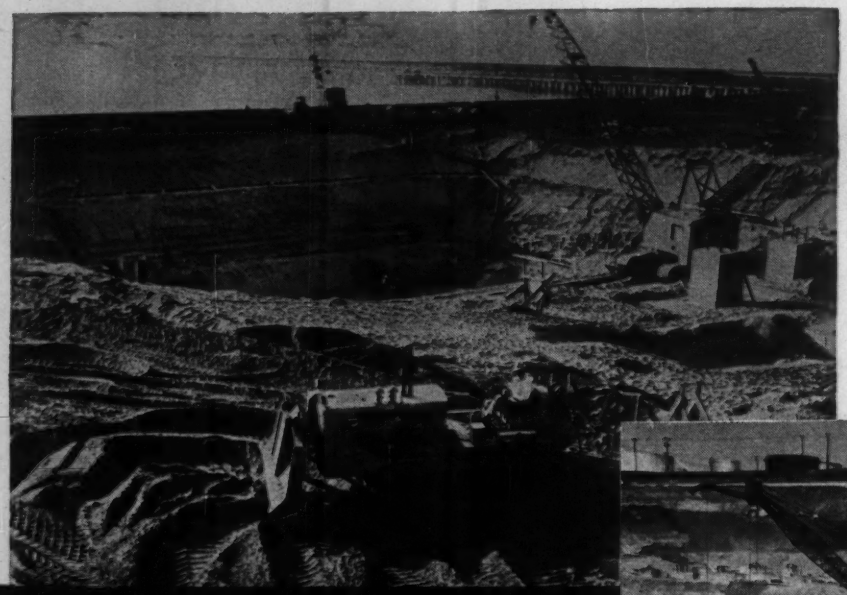

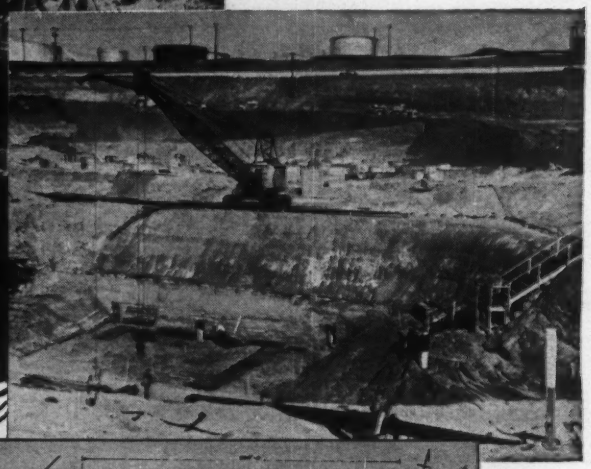

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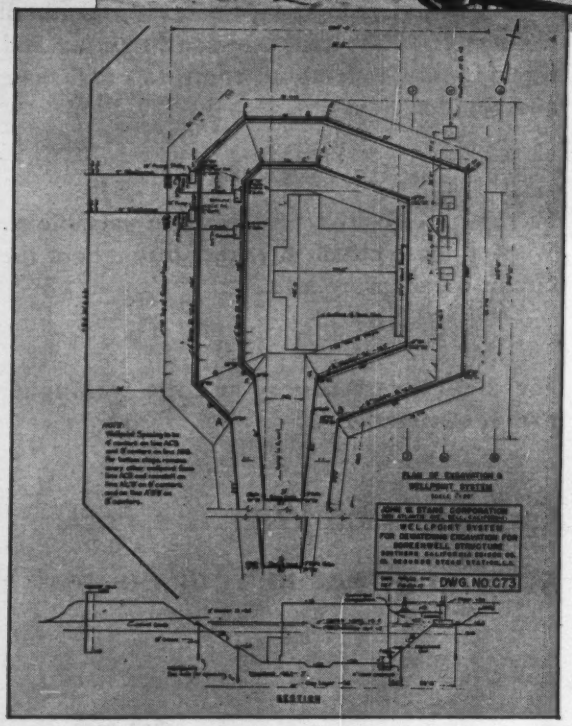
water under control!

STANG wellpoint job in beach sand...Down to 60 feet—30 feet below water level...*only 500 feet from ocean!*

Plans for an oceanside steamplant power station called for the construction of a reinforced concrete screenwell structure. Water and soil conditions were extremely adverse. The John W. Stang Corporation Engineering Service was called in. The resultant STANG plan (illustrated) *provided* completely dry excavation from the surface to a 60 foot depth . . . *utilized* dry-land excavation equipment 30 feet below water level . . . *made possible* the use of low-cost concrete forms. For fastest low-cost, construction when water is a problem . . . call STANG!



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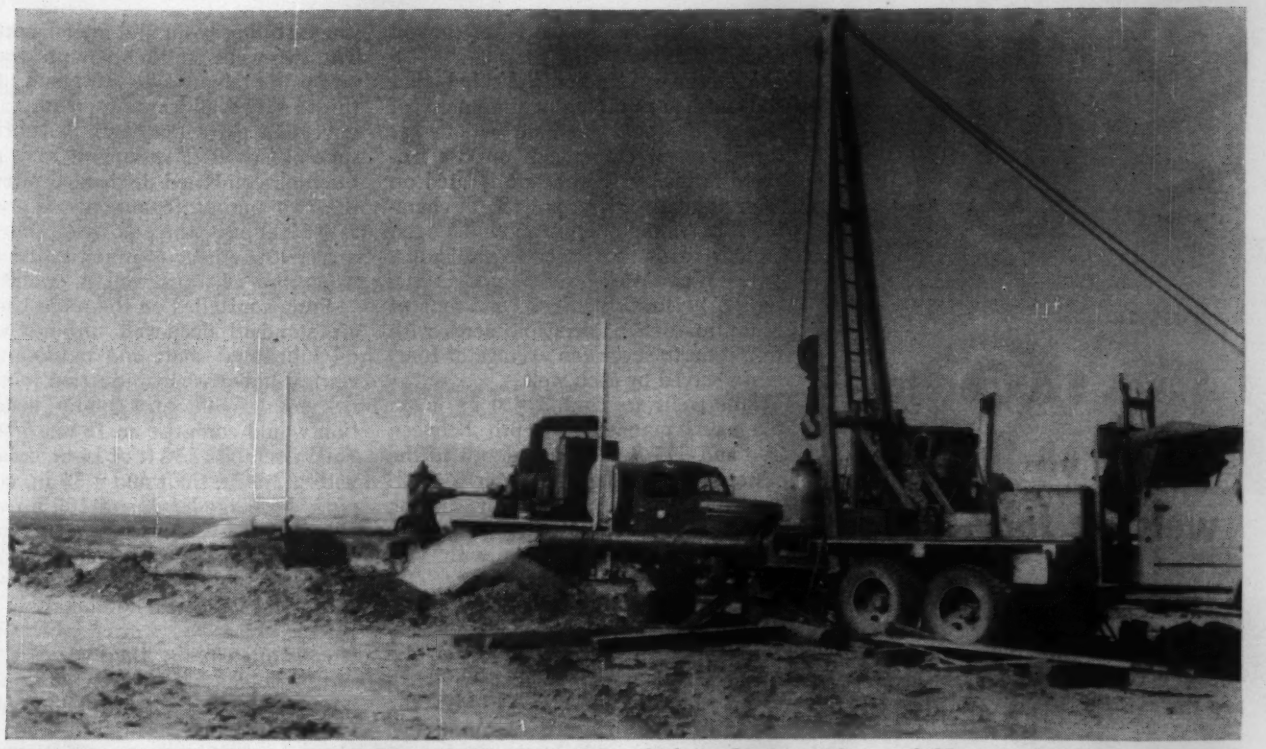


TESTS ON NEW WELLS on the USBR's Minidoka Project show high production with remarkably little drawdown. Two wells 40 ft apart are pumping with a combined discharge of 14.5 cfs.

Unfailing Wells Irrigate 64,000-Acre Project

Keith E. Anderson
Ground-water Geologist
U. S. Bureau of Reclamation
Boise, Idaho

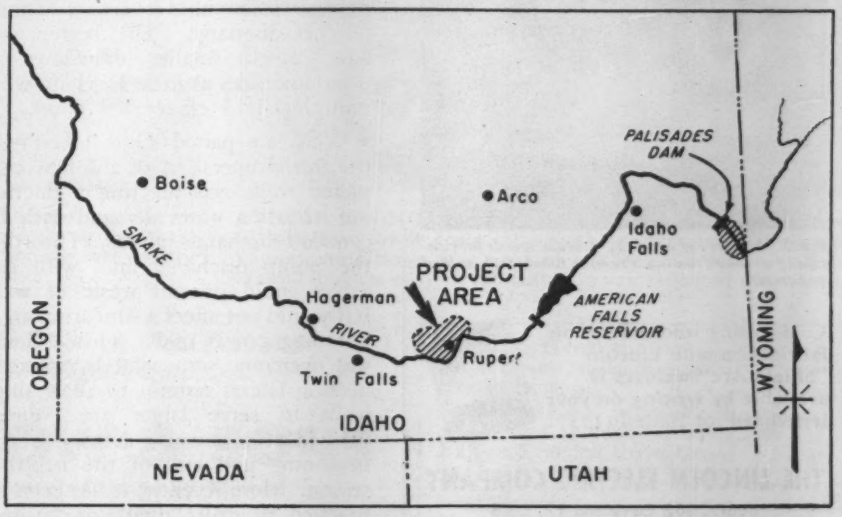
Wells that literally have "no drawdown" are key elements in a 64,000-acre irrigation project now in the third year of development in southern Idaho. A unique geological formation makes the wells possible. And this contributes to feasibility of the largest single ground-water irrigation project yet built.

The project is the Bureau of Reclamation's North Side Pumping Division of the Minidoka Project located on the Snake River near Rupert, Idaho. Some 175 high-capacity wells will serve the 64,000 acres. An adidtional 13,650 acres will be served by a 240-cfs pumping plant on the river.

The $11 million project was authorized by Congress in 1950. Water is scheduled for delivery to the entire area by 1958. Some 16,000 acres are ready to receive water for crop production this summer.

More than 2½ million acres of land in the U. S. are irrigated by water pumped from wells. This is about one-seventh the total U. S. irrigated acreage. But most well irrigation systems serve individual farms or, at the most, a group of three or four farms. And almost all of the areas were privately developed. The Minidoka Project lands, on the other hand, are practically all in the public domain. They were originally scheduled to receive water from upstream storage reservoirs. But not enough storage was available. This led to investigation and eventual adoption of the ground-water pumping scheme.

• **Substrata is broken basalt**—The Snake River plain of southern Idaho is underlain to depths of many hundreds of feet by exceedingly permeable basalt flows. This fractured and creviced lava makes up an enormous reservoir which is fed by infiltrating rainfall and by numerous streams that disappear into "sinks" on the lava plain near Arco. The outlet or overflow from the groundwater reservoir is chiefly in the many large springs which annually discharge more than 4,000,000 acre-ft



SOUTHERN IDAHO where the project is located already has extensive irrigation installations. Idaho is the third ranking state in the U. S. in irrigated acreage.

Fig. 1. Tacking roof joints in position on 440' x 440' all welded frame work.

Saves $20 per ton with on-the-job welding fabrication

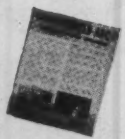
SITE fabrication of structural steel for this new 440' x 440' plant saved as much as $20 per ton on the cost of steel as compared to buying fabricated building members.

Clips and base plates were first welded to columns. Largest plates were ½" x 14" x 14". Principal steel members were 24" 110 pound wide-flange beams, 39' 3" long; 8", 31 pound columns.

Forty-foot clear-span joists were used, tack welded on 6' 8" centers, and later welded along both sides and top and bottom edges. Steel deck roofing was welded with Lincoln "Fleetweld 5", burning through the 20 gauge deck for a plug weld to the joists.

Fig. 2. "Fixture" of heavy 24" I beam speeds fabrication of window framing. Framing is only tack welded to fixture.

Cost-cutting information on fabrication with Lincoln "Shield-Arc" welders is available by writing on your letterhead for Bulletin 1337.



THE LINCOLN ELECTRIC COMPANY

Dept. 2302 Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

of water into the Snake River canyon near Hagerman.

Preliminary studies indicated that the annual pumping requirement of the wells would be 3.68 acre-ft per acre to meet crop needs on the irrigated farms. The wells are located on high points over the project, discharging into stilling pools from which open laterals carry the water to individual farm units. Wells and pumps are designed to furnish one second-foot of water to each 65 irrigable acres with from one to seven (an average of four) farms served by each well.

The wells are from 16 to 24 in. in diameter, ranging in depth between 190 and 395 ft. Average depth to the water table is slightly under 200 ft. Experience has shown that drilling about 85 ft below water table will furnish the desired yields with very little drawdown.

All drilling is being done under contract by cable-tool rigs. Four contractors participated in the drilling of the first 95 wells. Wells are cased with ⅜-in. wall-thickness pipe through the top soil and other surface formations 2 ft into the lava bedrock which is at an average depth of about 30 ft. The open hole is continued through the rock. The basalt is broken and creviced, resulting in extremely high permeabilities, and commonly all of the drill cuttings are lost from the hole into subterranean openings. Loose or caving rock which would require installation of added casing or liners, however, is not generally a problem.

The project is unique in that pump capacities can be selected, almost without exception, in advance of drilling, based upon the acreage of land to be served by the well. These design capacities range from 0.8 to 10.6 cfs and average 5.6 cfs (2,500 gpm). The "poorest" wells are those in which the drawdown amounts to a foot or more per cfs discharge. The better wells have much smaller drawdowns—in some instances as little as 5¼ in. when pumping 10.3 cfs (4,600 gpm).

• **Wells are paired**—One difficulty in the initial operation of the first completed wells was meeting a fluctuating irrigation water demand with the constant-discharge pumps. Throttling the pump discharge lines with gate valves could prevent waste of water but would not affect a similar saving of pumping power costs. This difficulty was overcome somewhat by interconnecting lateral systems to allow single wells to serve larger areas during periods of low water demand at the beginning and end of the irrigation season. More recently, it has been the practice to drill "dual" or "paired" wells in which two wells, spaced only 40 to 60 ft apart, discharge into a single stilling basin and lateral system. The two wells are then equipped with pumps of about one-third and two-thirds the total capacity required to serve that particular block of land. In spite of this close spacing of wells and the high combined discharged rates of the two pumps (commonly as much as 6,500 gpm), there is usually no appreciable lowering of water in one well when the adjacent well is operating.

Pumps installed on the project wells are standard deep-well turbines with oil lubricated shaft and outdoor-type vertical hollow-shaft induction motors. A typical 2,500 gpm pump installation would comprise an 18-in., 5 stage bowl assembly; 240 ft of 14-in. column with a 2 7/16 in. shaft and a 3¼ in. cover pipe; discharge head; and 200 hp electric motor. Motors are generally rated at 1,200 rpm and either 2,300 or 440 v depending upon their horsepower. Motor controls are a combination, full voltage, magnetic starter which provide short circuit, thermal overload, and single-phase protection with undervoltage release. All control equipment is suitably housed for outdoor installation. Substations are provided at each stilling basin to transform the 34.5 kv distribution voltage to motor voltage.

Practically all of the project lands are publicly owned and will be divided into farm units averaging 100 irrigable acres. In 1953, 72 reclamation homesteads comprising 7,289 acres of irrigable land were opened to entry. These farm units were cleared, leveled, farm distribution systems constructed, and a substantial part of the irrigable acreage (estimated 6,633 acres) in crop in 1954. The 1954 average gross crop return is estimated at $90 per irrigable acre for the 7,289 acres for which water was available. In July, 1954, another 85 farm units were opened to homestead entry. There were 4,910 applicants in the public drawing for these farm units. The project will ultimately include some 695 farm units. The major crops on the projects are wheat, sugar beets, and beans.

Construction Engineer for the Bureau of Reclamation at Rupert, Idaho, is O. L. Kime. W. J. Attridge is field engineer and W. H. Clark is office engineer.

Law Creates Commission

The North Carolina Legislature has enacted into law a bill creating a commission to make a study of the organization and operations of the State Highway Commission. Gov. Luther H. Hodges requested the study group. He said the Highway Commission needs to look at road problems from a statewide point of view instead of on a division basis.

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CLOW RIVER-CROSSING CAST IRON PIPE TAKES 'EM "IN STRIDE"!

EASY TO LAY. As easy to make up as a standard flanged joint. Lower labor installation cost because of ease of joint make-up and longer laying lengths.

ONLY A RATCHET WRENCH NEEDED. No split parts. Fewer parts—each joint consisting of one complete pipe, one solid follower ring, one solid ring gasket, bolts and nuts.

FULL 15° TURNING DEFLECTION with absolutely no reduction in the full internal opening area—therefore, no abnormal pressure-drops at deflected joints. Deflection stresses evenly distributed among all the bolts.

LONGER LAYING LENGTHS—approximately 18′6″—faster installation, lower costs. However, lengths may be varied to suit conditions. For example: 6 foot, 12 foot or other special lengths may be advisable to suit required curvature.

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Street Address_____
City_____ **Zone**_____ **State**_____
Individual's Name_____
Position_____

READY TO ROLL, the stripped-down American 300 Series Truck Crane owned by the Moore Dry Dock Company can travel over any highway in California. By using an ingenious "possum belly" trailer, the unit's total weight is distributed over five axles, meeting road limits easily.

"STRIP-EASE" SOLVES HIGHWAY WEIGHT PROBLEM

Highway weight restrictions, which can tie up heavy equipment on one job when it is needed on another, plague contractors in many states. Fortunately for American owners, the American 300 Series Truck Crane can be "stripped" speedily and easily. The Moore Dry Dock Company of California, for instance, has found that they can load the boom and counterweight on their specially-designed trailer in a very short time. Thus, by dividing up the weight, the unit can meet all legal axle load limits for any highway in the state. This fact means that the powerful, versatile crane can be hustled from job to job without the delay of obtaining special permits, saving time and money for Moore Dry Dock.

SMOOTHLY AND EASILY the American 300 Series Truck Crane uses its own mechanism to remove its counterweight, (1). Then, it lifts the counterweight, (2); and lowers it into the "belly" of the trailer, (3). With the boom lowered into its cradle on the top of the trailer, the American Crane is ready to move to its next job.

For generations, high-production American products have been first choice on the world's biggest and toughest jobs. For full, factual information on the many advantages offered you by efficient American Truck and Crawler Cranes, see your American Distributor or write American Hoist & Derrick, St. Paul 1, Minnesota.

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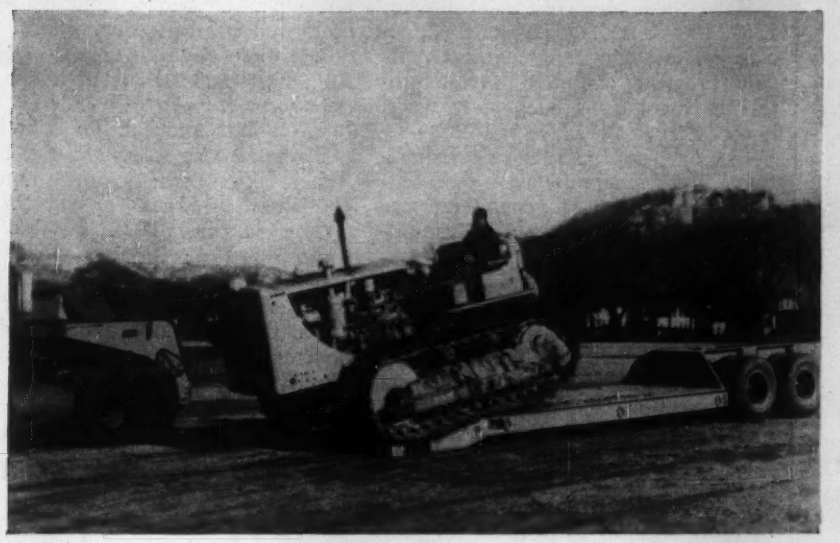

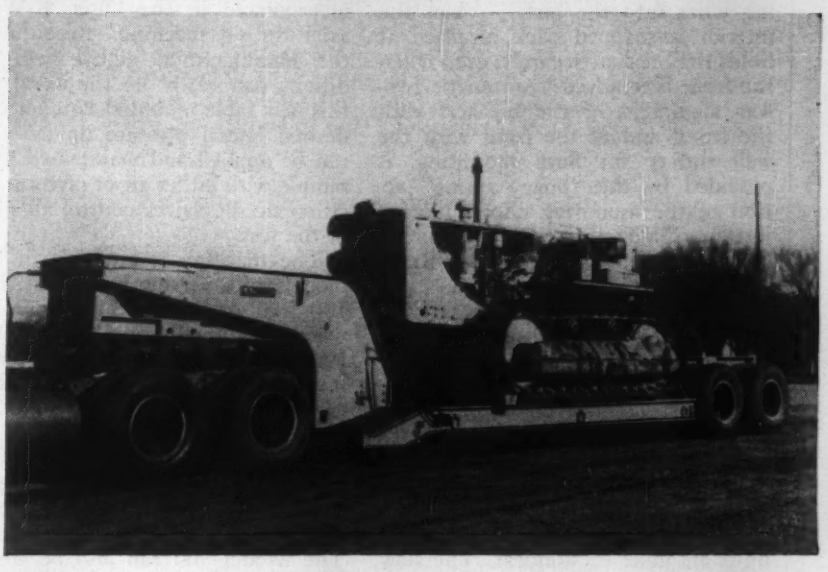

Trailer Can Be Loaded by One Man

A powerized gooseneck trailer has been developed which can be loaded or unloaded by one man—without skids.

Designed especially for moving heavy loads in congested areas, or where low overhead clearance is a problem, the new trailer combines low carrying height with an arrangement that permits disconnecting the gooseneck automatically from the rest of the trailer, for loading or unloading over the front end. The gooseneck contains a double-acting hydraulic unit that raises and lowers the trailer platform, and which can also be used to raise the rear wheels of the tractor for changing tires, or to lower the trailer bed to "stoop" under low wires or underpasses.

Main advantage of the new unit, according to the manufacturer, is that the only mechanical connection between gooseneck and trailer is a standard inverted fifth wheel in the base of the gooseneck. This attaches to a standard spring-loaded king pin on the front of the trailer platform to provide a hook-up that is said to be easy to line up and virtually automatic in operation. It also makes the gooseneck a controlled-part of the tractor and provides a means of power source, either self-contained gas or electric, or through power takeoff from the tractor.

Operation of the new trailer is reportedly very simple. The driver turns a hydraulic lever on the curb of gooseneck. The trailer platform, with builtin ramp, is lowered to 6-in. unloading height by hydraulic power. Then the driver disconnects the air hoses, pulls the fifth wheel lock, and drives the tractor away. This takes about 3 min and the driver is then ready to unload his equipment over the front end of the trailer. When he wants to move again, he loads his outfit onto the trailer, backs in his tractor and reverses the above procedure.

The powered gooseneck is a firmly held part of the tractor at all times. There are no parts to swing and sway when the tractor is disconnected and there is no danger of traveling over moving pins or joints, during the disconnecting process. In addition, there are no parts to get out of alignment because the only connection between the gooseneck and the bed of the trailer is the standard fifth wheel and a standard self-aligning king pin.

The self-contained hydraulic system in the gooseneck consists of a vane-type pump with double acting cylinder, actuated by a small, air-cooled gasoline engine.

After being lifted to travel position, the trailer platform is locked mechanically, by means of a rigid torque tube and double toggle arm arrangement, entirely independent of the hydraulic system.

The latest powerized gooseneck model is the LXC-33D which has a 33-ton capacity and is spring-mounted, with 10:00x20, 14-ply tires. Its 16x8-ft loading surface can be increased to 10-ft width by means of extension brackets. Flat areas at either end are available for other loads. LaCrosse Trailer Corp., LaCrosse, Wis.

12-Circuit Load Center Said to Be Easily Installed

A 12-circuit load center with a 100-ampere main breaker wired into the box has been designed for homes, shops, garages, and commercial and office buildings.

Suitable for service equipment, the new load center encloses in a single unit both the main disconnect breaker and the branch circuit breakers. This "combination" design eliminates the need for a separate main entrance switch.

A front with full length door is standard equipment on the new load

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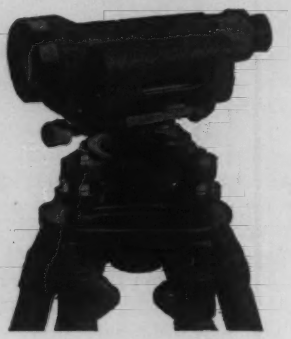

The NK3 offers over 100 years of Swiss Master Craftsmanship and the latest technical achievements compressed into 4 lbs. of maximum precision, operational efficiency and economy.

- Mean leveling accuracy per mile (normal conditions) ± .008 Ft.
- Coincidence bubble is viewed directly through 30X telescope, allowing constant check on bubble centering while reading rod.
- Ready for use right out of the case. Highest precision leveling with coincidence spirit level and tilting screw. Coated optics give increased brilliance and contrast in the image.

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center, and to make the device tamper-proof, an optional lock kit for field installation is available.

Rated for use with 100-ampere, 120/240-volt ac single-phase three-wire service, the load center reportedly provides complete circuit protection for today's adequately wired home.

Listed by Underwriters' Laboratories, the new combination load center is available in a general purpose enclosure for surface or flush mounting. Installation is said to be simplified by several features. Since the main breaker is wired in, the electrician has to install only one unit for a complete service entrance system. Straight-in wiring is used on all connection terminals to eliminate looping wire ends and make connecting easy.

The interior is spring-mounted. It can be snapped out without the use of tools to allow extra room for pulling wires into the box. When the interior is snapped back in place, it holds the breakers securely, even when the front is removed. Automatic two-way alignment of the breakers with the front, and of the front with the wall surface for flush mounting, is provided by the "buggy spring" action of the mounting clips. No adjustments are required. TRUMBULL COMPONENTS DEPT., GENERAL ELECTRIC CO., PLAINVILLE, CONN.

Two-Speed Revolving Door Saves Money, Speeds Traffic

A two-speed revolving door has been designed to revolve at 3 rpm constantly and from 9 to 12 rpm when a person touches the crossbar of the door.

In comparison with single-speed motorized revolving doors, the new units are more economical. The slow, not-in-use speed reduces the amount of heated or cooled air admitted and also reduces the amount of wear on the door parts.

In comparison with motorized swing doors, the savings are reported to be even greater. According to the manufacturer, under equivalent conditions the powered revolving door admits 26 cu ft of air per person entering or exiting, while a power-operated swing door admits 2,600 cu ft.

The door has several features to accommodate people in a hurry and at the same time safeguard those who wish to go slowly or even stop while going through the door. A clutch device permits the door to be accelerated and a brake mechanism allows the door to be retarded or pushed in the opposite direction by individuals who may enter the wrong way or reverse their direction.

The manufacturer says that it is impossible for anyone to be injured in the motorized revolving door should they decide to stop while going through it. An adjustable disc clutch allows the door to be stopped with only 10 lb of force, and to prevent the door from being rotated at an unsafe speed, the motor drive contains an automatic centrifugal speed control brake.

The first installation of the two-speed doors has been made in the Pioneer Building, St. Paul, Minn. The cost here was about $2,000 over and above that of conventional revolving door entrance. INTERNATIONAL STEEL CO., EVANSVILLE, IND.

Soil Machine Has Controls For Triaxial Shear Testing

Controls for both routine and special triaxial shear testing of soil are incorporated in the Olsen K-W triaxial testing machine. According to the manufacturer, actual field conditions can easily be simulated with this new table mounted unit since any desired lateral pressure up to 50 psi can be applied and maintained to the sample with either air or glycerin. Precision needle valves control all phases of the test.

The machine is available in three models with varying load capacities of 100, 250, or 500 lb. The Model 500, which is normally used with a 500-lb load capacity, is designed for a maximum 2,000-lb capacity. It also has a variable speed drive of 0 to 0.2 in. per min.

All three models can be converted into unconfined compression testing machines by removing the test chamber and making a few adjustments. The Model 500 can also be adapted for California bearing ratio penetration tests. TINIUS OLSEN TESTING MACHINE CO., 5047 EASTON RD., WILLOW GROVE, PA.

Aluminum Construction Pipe Now In Production by Alcoa

Production of welded aluminum construction pipe by Alcoa has been made possible by the installation of two new welded tube mills at the company's Alcoa, Tenn. works.

The new product supplements the company's line of extruded construction pipe and provides an Alclad pipe for unusually corrosive construction pipe applications.

The Alclad pipe has a thin layer of a special aluminum alloy on both its inner and outer surfaces. This coating,

7 and 11-Wheeled Rollers Weigh 25 Tons

Two new self-propelled, rubber-tired rollers are available, each weighing 25 tons when fully ballasted with sand. Model 257 (shown above) is a seven-wheeled unit; Model 2511 has 11 wheels. Both are equipped with a Minneapolis-Moline 62-hp gasoline engine or a diesel, if specified, and have six speeds forward and six reverse with a top speed of 14½ mph in either direction. 12-ply, 9:00x20 tires are arranged to conform with Corps of Engineers specifications, and on the 257, pressures up to 795 lb per in. of tire width are obtained. The units are steered hydraulically. Overall width of both units is 8 ft. Both compactors are suitable for rolling earth, gravel, crushed rock and similar materials; while the 2511 is more effective for rolling paving materials. Shovel Supply Co., 4900 Hines Blvd., P. O. Box 1369, Dallas 21.

which is an integral part of the pipe, gives protection to the 3004 Aluminum Alloy core under many corrosive conditions.

The pipe is available in 3, 4 and 6 in. diameters and in 20, 30 and 40 ft lengths. Prices and wall thicknesses are the same as for Alcoa's extruded aluminum construction pipe. Yield and bursting strengths are about the same as 6063-T6 extruded pipe.

The weld bead is fully removed from the outside of the pipe, and partially removed from the inside.

Aluminum construction pipe is used with suitable couplers to carry compressed air or water on various construction jobs. Extensive use has been made of such pipe to carry compressed air to wagon drills. Aluminum Company of America, 758 Alcoa Bldg., Pittsburgh 19, Pa.

Trailer-Mounted Lighting Unit Has 10-kw Generator

A trailer-mounted lighting unit for the heavy construction industry consists of a 10-kw engine generator and a series of six 1,500-w lamps. Full swivel and vertical adjustment gives the unit considerable flexibility and the lamps may be removed and spotted in various positions and distances around the generator.

A panel board permits individual control of the lights as well as providing receptacle outlets for the operation of power tools. United States Motors Corp., Oshkosh, Wis.

Roof Coating Said To Cut Inside Temperatures 20 Deg

Siliconed Asbestolite is an aluminum coating that is reported to protect and preserve roofs while reducing underroof temperatures as much as 20 deg. The coating is composed basically of asphalt, asbestos and waterproofing oils to which has been added silicones and aluminum flakes.

In addition to heat-insulating qualities, Asbestolite is said to shield buildings against cold. By holding roof temperatures more nearly constant with those of building interiors, it is claimed to reduce condensation by 60 to 70%. Consequently, it is said to be suited for application over concrete block walls.

The compound comes mixed and ready to use in 5-gal cans and 30 and 55 gal drums. It does not require heating or thinning and can be sprayed on or applied with a roofing brush or squeegee. It is said to be suitable for use on all types of roofs and reportedly can be applied over old coating without bleeding. The Monroe Co., Inc., 10703 Quebec Ave., Cleveland.

(New Products continued on page 64)

Foundations, Floors, Reservoirs, Other Concrete Structures Can Be Made to Last Longer!

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Zilicon Waterproofing Paste, added directly to the "mix," distributes itself evenly throughout the concrete and provides uniform water repellency. By minimizing the absorption of water, you insure the life of the concrete against damage from its worst enemy.

Truscon Zilicon has been used to waterproof concrete in construction projects all over the world. Added to Portland cement mortars and concrete mixes, it also provides these benefits . . .

- Makes concrete more resistant to freezing and thawing, wetting and drying
- Lubricates the mix, makes for easier workability, easier flow
- Reduces tendency to "honey-comb," saving the after-cost of patching
- Contains no calcium chloride or other chemical that tends to flash the set, won't corrode reinforcing steel
- Contains no lime, clay or other extenders added solely for bulk or weight

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The most substantial grating design made for distribution of heavy loads and rugged needs. Provides maximum traction combined with smoothness for walking, working, wheeling in all directions.

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Special cross bar effects smoothest, most efficient one-piece welded construction, assuring maximum strength with minimum weight, and safety underfoot.

PRESSURE-LOCKED "X-BAR"

The cross and bearing bars are locked under tremendous hydraulic pressure to provide a strong, safe, lightweight floor. X-Bar Grating is self-cleaning and most economical.

ALUMINUM

In riveted and pressure-locked types only. Extra-light, corrosion-resistant, spark-proof. Ideal for chemical and petroleum industries.

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1863 10th St., Oakland 20, California

Lightweight Imported Transit Sells for $350

A survey transit used in airport construction in the Far East is now available here. Weighing 9 lb, it is designed especially for field work where minimum weight is desirable.

The imported instrument has a 5-in. dia horizontal circle and a 4½-in. vertical circle. Both read to 30 min with vernier readings to 1 min. The telescope is 9 in. long with a 23X magnification. Stadia lines are fixed at 1:100 ratio.

This instrument is made to American standards under American supervision and is rechecked on arrival in U. S. Sold under full money-back guarantee. Price $350. Umeco Optical Div., 465 California St., San Francisco 4, Calif.

Grinder Reduces Coarse Sewage Without Head Loss

A new unit has been developed for screening and comminuting rags, cans, rubber products, glass, rope, wood and other coarse sewage materials. The Rotagrator screen and comminutor is designed for use by the larger communities with flows ranging from 1,900 to 50,000 gpm.

The unit is said to screen and shred materials without rejection or removal from the flow. According to the manufacturer, it functions at low head loss, holding solids upstream until they are rendered to a size permitting passage downstream, thus enabling the machine to handle efficiently a wide variety of solids. Infilco, Inc., 921 South Campbell Ave., Tucson, Ariz.

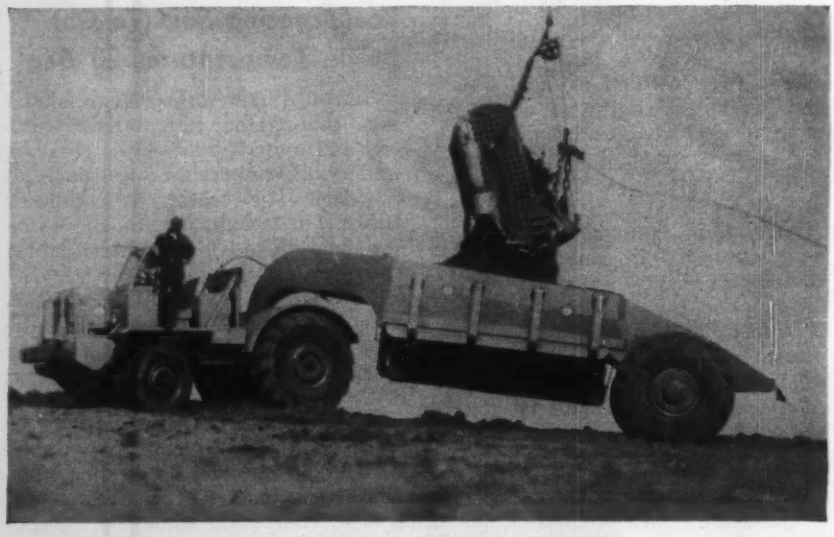
Pneumatic Tired Roller Has Interchangeable Tongues

Interchangeable tongues, to fit either crawler tractors, or the wheeled prime movers, are an improved feature of the model W18R 50-ton pneumatic roller.

All types of tongues, including the one for crawler tractors, are arched so that clearance is provided for wheels or tracks to permit shorter turns and prevent damage to tires or tracks. The roller is equipped with four 18:00 x 24, 24-ply tires.

The tires may be inflated to 50 lb for rolling service and at this pressure are rated at 21,00 lb load per wheel. Load per wheel may be increased as air pressure is increased, and at 90 lb air pressure, the wheel load may be 30,200 lb.

The body of the roller has a capacity of 60 tons of gravel or sand when heaped. Axles and bearings are ample for 60 tons, and the roller is



15-Yd Dirt Wagon Has New-Type Hitch

A new 15-cu yd dirt wagon has a low center of gravity and a new ball-type hitch that reportedly allows the tractor or trailer to be in any position without putting undue strain on the tractor or wagon. The doors are operated by cables and actuated by a hydraulic cylinder operated from a valve located in cab of tractor. The doors may be opened to any position so material can be windrowed and may be closed at any time whether the wagon is moving or stationary. Whenever instantaneous dumping is desired, the hydraulic valve is simply set in the dump position. The Webb Corp., Webb City, Missouri.

rated at 60 tons when 90 lbs air pressure is used. All wheels oscillate to provide even compaction in rough going. W. E. GRACE MFG. CO., 6015 S. LAMAR ST., DALLAS, TEX.

600 cfm Rotary Has Water Cooling, Is Light in Weight

A portable rotary air compressor is said to combine the rotary's advantages of compactness, light weight and simplicity with the advantages of water cooling. The compressor has a capacity of 600 cfpm.

The water-cooled compressor is reported to provide reliable operation under severe weather conditions ranging from 40 deg below zero to 115 F above. The water-circulating system is automatic and maintains the most efficient operating temperature for both the engine and the compressor. In cold weather, warm water from the engine heats up the compressor oil system before the compressor starts to turn, and normal oil flow through the compressor is assured from the moment the compressor is engaged.

A clutch is provided between the engine and compressor so that the compressor load may be disengaged for easier engine starting during cold weather.

The compressor oil system, supplied through a metered oil flow, performs lubricating, sealing and cooling functions independent of air pressure. A special unit prevents contamination of the oil by moisture condensation, and keeps oil circulation from freezing up. Other units work to remove oil from the air.

The rotary is equipped with a speed control that is reported to save fuel and wear and tear on the engine and compressor, because it keeps operating speed of the unit in line with air demands of the moment.

According to the manufacturer, the 600 has been designed for simplified maintenance in the field with the tools ordinarily available to the compressor mechanic. The two-stage, multivane compressor has two parallel cylinders cast in one block. Inspection covers provide access to vital parts, and regular mechanics can remove all compressor vanes for inspection or replacement in a matter of about half an hour, it is said.

Weight is 8,700 lb, width is 5 ft 11 in., height is 8 ft, length is 11 ft 2 in. Automotive-type running gear provides a turning radius of 14 ft and the compressor is powered by a General Motors diesel, model 6-71, with normal operating speed of 1,800 rpm. An electric starting system is furnished for the engine. GARDNER-DENVER CO., 100 WILLIAMSON ST., QUINCY, ILL.

How to restore and preserve costly masonry structures with **D-J Mortar, Thorite, Thoroseal and Thoroclear** *even though masonry looks beyond repair!*

Second Episcopal Church of Boston, Brookline, Mass.

Only the bare skeleton of cornice remains after years of disintegration.

To repair, all loose material was cut out and complete surface was wire brushed in preparation of THORITE treatment.

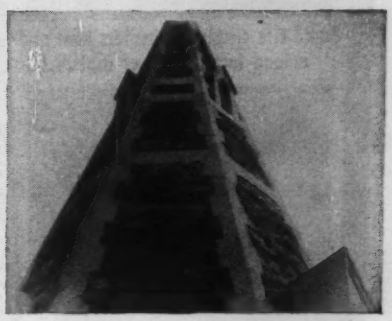
Above photos show how vines grew over stone structure and hid most of damaged masonry.

Vines were cut away from building and disintegrated joints grouted with D-J Grouting Mortar.

Stone trim was then given two coats of THOROSEAL. Entire surface received a coat of transparent THOROCLEAR.

AFTER Brush and trowel coat of THORITE, nonshrink patching mortar was used to restore this masonry to its original lines. A two-coat application of THOROSEAL was applied to beautify and protect the surface. Nonsagging THORITE can be used to model any masonry structure back to its original lines.

ALL MASONRY NEEDS PROTECTION



Stretcher stone work treated with D-J Grouting Mortar and entire stone surface THOROCLEARED.

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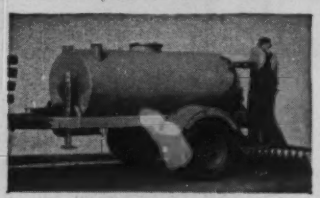
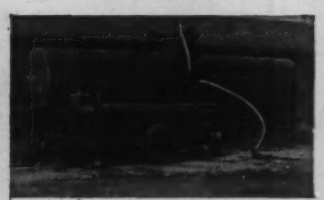
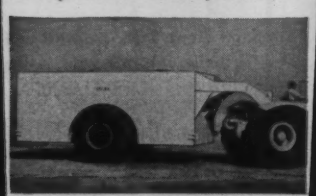


Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.

Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

6015 S. LAMAR, DALLAS, TEXAS

PUBLICATIONS

Electrical products—A new specification guide for architects and engineers covers "Scotch" brand electrical products for construction and maintenance work. The 12-page, two-color, illustrated guide describes applications, lists physical and electrical properties and provides representative specifications for each of the products used in the electrical construction and maintenance field.—Minnesota Mining and Manufacturing Co., Dept. E5-26, 900 Fauquier St., St. Paul 6, Minn.

Skylight—A new folder describes the Wasco line of prefabricated daylighting products including acrylic plastic skydome and related units that provide daylighting plus ventilation, automatic fire and safety venting, insulation and access to the roof. Each product is shown photographically and also in a detailed schematic drawing. Specifications are given for each. "Daylighting With Wascolite Skydomes."—Wasco Products, Inc., 93P Fawcett St., Cambridge 38, Mass.

Load centers – A bulletin describes G-E's line of circuit breaker load centers for residential and light commercial service entrance installations. The 12-pager, designated GEC-1309, contains information on product features and applications of the new load centers, circuit breakers, and accessories, as well as information on merchandising aids available for the use of contractors. In addition, the bulletin provides data on ratings, specifications, wiring diagrams and dimensions for the load centers.—General Electric Co., Trumbull Dept., Plainville, Conn.

Wood roof truss construction—Essentials of wood roof truss construction are detailed for timber fabricators, contractors and builders in a new publication "Timber Fabrication and Assembly with Teco Connectors." The two basic members of timber truss fabrication—preassembly and prefabrication—are described and illustrated in the 12-page booklet. Also described are proper procedures for erecting timber trusses and tightening the joints.—Timber Engineering Co., 1319-18th St. N. W., Washington 6, D. C.

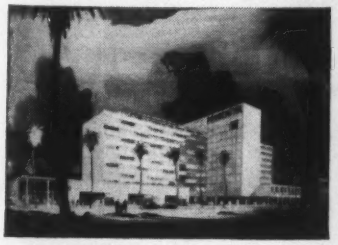
Curtain walls – "The Curtain Wall Story" describes the new techniques and equipment being used to field assemble insulated metal curtain and sandwich walls. The illustrated 20-page brochure is designed for use by architects, engineers, contractors, and building owners. — Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio.

Cellular glass insulation – A 12-page brochure "Foamglas in Thin Wall & Sandwich Panel Construction" provides information on the advantages of this type of insulation and also contains photographs and details of projects utilizing this technique. Fabrication and job data accompany each project. The brochure covers porcelain enamel panels, aluminum and stainless steel facings, concrete panels and spandrel construction. Under each heading are photographs, panel cross sections and job data on the significant examples of this type of construction. — Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh, Pa.

Building cooling—Tips on ways to apply economical and efficient air conditioning to more than a score of different types of buildings, ranging from homes to manufacturing plants and retail establishments are outlined in a new booklet. Entitled "Guideposts to Better Air Conditioning Installations" the 36-page booklet is a compilation of semi-technical articles by engineering consultants. Separate sections are devoted to comfort cooling of living quarters, including hotels and apartment houses; public and commercial buildings, hospitals and restaurants; manufacturing and warehousing plants; and retail shopping centers as well as individual stores. Another section contains suggestions on the most practical location of air conditioning equipment from a building design standpoint. Booklet A-8726.—Product Information Service, E. I. du Pont de Nemours & Co., Wilmington, Del.

Dozer blades – Hydraulic bullgrader and bulldozer blades matched to International T-6, TD-6, T-9, TD-9, TD-14A and D-18A crawlers are described in a new 24-page catalog. Full specifications of the International blades and pictures of them on the job are contained in the catalog.—Consumer Relations Dept., International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Transit level—A new folder describes the new Warren-Knight transit level which operates like a transit, but, it is said, costs only one-half the average transit price. At the same time it may be adjusted like a Wye level.—Dept. W., Warren-Knight Co., 136 N. 12th St., Philadelphia 7, Pa.



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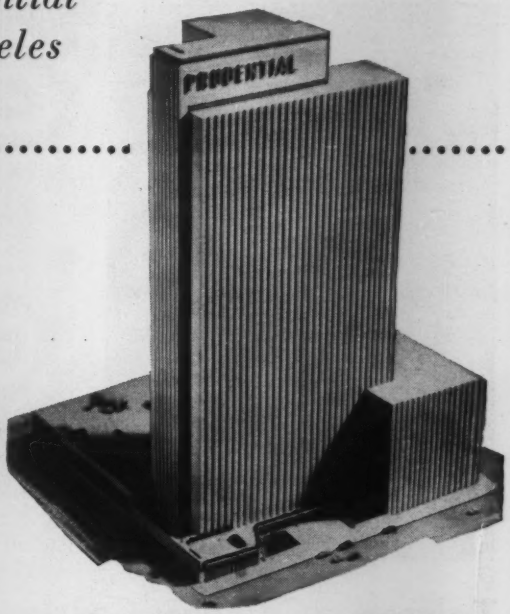

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Take the Prudential story, for example. In 1948, Prudential used Zonolite in its Los Angeles building (illus. top left). By using Zonolite vermiculite Plaster instead of poured concrete for fireproofing steel, the weight per running foot was reduced from 225 pounds to *25!* Cost per running foot was cut from $4.70 to $3.00. Zonolite saved weight; saved money, too. And *earned the highest attainable fire rating!*

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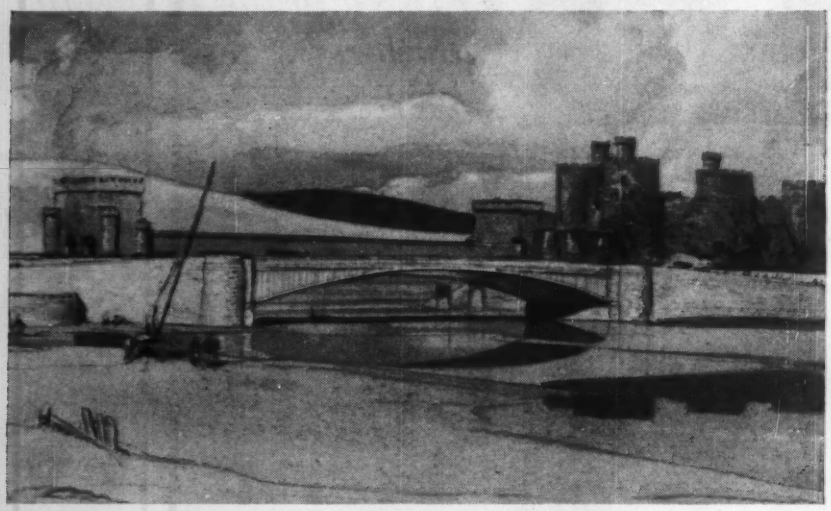


FAMOUS CHAIN SUSPENSION BRIDGE in Wales (left) is to be replaced by a modern arch which will alter the landscape as shown in the architectural rendering.

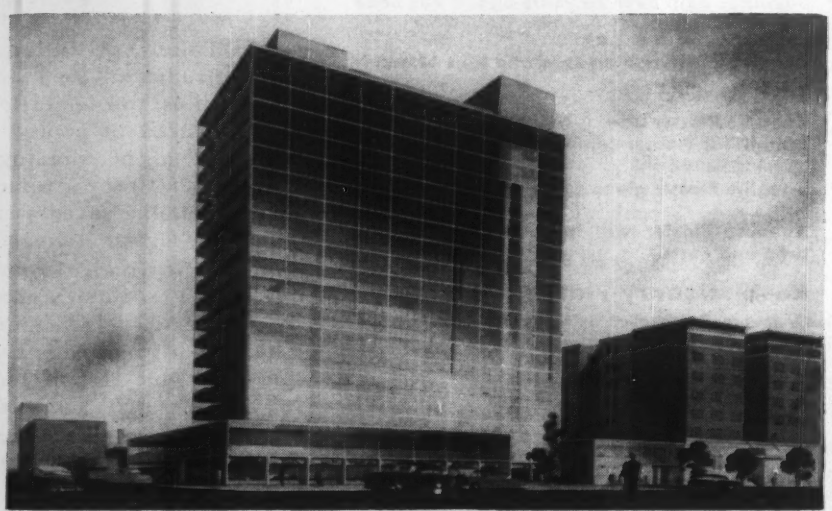
Telford's Conway Castle Bridge Bows to Growth in Traffic

Work is to begin very soon on the construction of a new bridge over the Conway River in North Wales at a location made world famous by an earlier bridge, whose designer and builder was Thomas Telford, known the world over for his bridge, highway and canal projects, which included the Menai Straits suspension bridge and the Caledonia Canal. Telford's Conway Castle Bridge, completed in 1826, was one of the early wrought iron chain suspension spans, and thus a significant pioneer structure, but its lasting fame has probably been due to the architecture of its towers, which followed that of the adjacent castle.

The new bridge will be a steel arch (four ribs wide and of 310 ft span), but it will also be faced in stone and utilize some tower motifs on the abutments in order to be consistent with its castle surroundings. These also include Stephenson's railway bridge (shown in the above illustrations) built by this other famous British engineer in 1848 with battlemented portal towers at either end. (The structure between these old bridges in the left photo above is relatively recent addition that carries water mains across the river.

The new bridge will be parallel to and about 180 ft away from Telford's Conway Castle Bridge, which will be removed because its single-lane roadway is of little use under modern traffic conditions. The overall width of the new bridge will only be 31 ft 6 in., providing for a 22 ft roadway and a sidewalk, but it is designed for later widening when and if that should become necessary. Including the approaches, the new project will be about a quarter of a mile long. It will be built by Sir William Arrol and Co., Ltd., of Glasgow, Scotland, under a contract let by the British Ministry of Transport and Civil Aviation for $1,205,960, and contemplating completion in 2½ years.

Sir Percy Thomas is the consulting architect and H. W. FitzSimmons the consulting engineer.



Vancouver to Get Modern Tower

Curtain walls of aluminum and heat-absorbing glass will make a new $7-million, 20-story skyscraper, in Vancouver, B. C., one of the lightest structures of its type and size in North America.

Four other factors, besides aluminum-glass walls which contributed to general weight-saving features were: (1) The all-welded steel frame will be fireproofed with light-weight plaster instead of concrete; (2) metal stud interior partitions will be used instead of clay tile walls; (3) a structural metal sub-floor will be used instead of concrete slab; (4) cover on the sub-floor

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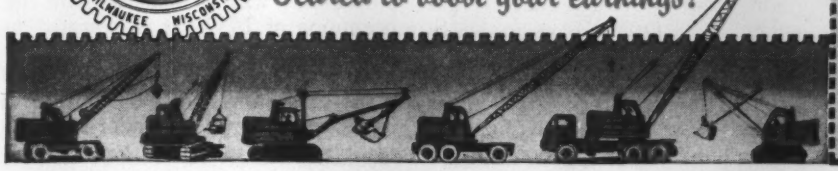

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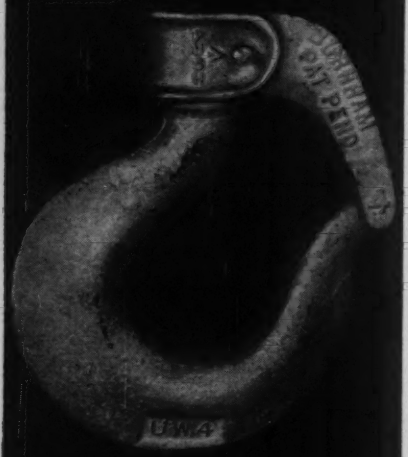

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will be only 2½-in. thick lightweight concrete laid on corrugated metal sheets.

It is estimated that the weight of completed structure will be about two-thirds that of conventional construction of similar size.

Only heavy masonry will be used in the rear wall and for roof structures.

The tower, to be topped with a 3,000-sq-ft glass penthouse, came a step nearer reality with call for tenders (this week) for excavation work for the 262x131-ft, two-tiered, 22-ft-deep basement which will be used exclusively for parking, holding 174 cars.

The 66x190-ft tower rises immediately from street level, on a welded steel frame weighing about 2,000 tons. Steel columns are 14 in. WF and main beams 21 in. deep.

The frame has been designed to withstand earthquake stress and is second major building in Vancouver to provide for this emergency (General Post Office Building now under construction was first all-welded steel frame building to provide this feature in Vancouver).

Spandrel trusses, are used for first time in Vancouver.

Designers are C. B. K. van Norman and Associates for Utah Construction Company of The Americas, the general contractors.

A "Ruhr Valley" Slated For British Columbia

A miniature "Ruhr Valley" is in the making for British Columbia as result of announcement in Vancouver of plans to establish what will ultimately become a $100 million metallurgical development to produce 10,000,000 tons of steel annually.

The plan provides for immediate establishment of $10-million, 50,000-tons-a-year steel smelter and mill at an undisclosed upcoast site; establishment of a $7 million cement manufacturing plant at nearby Chiliwach, and $3 million worth of other construction projects, including office and apartment building and a hotel in Vancouver.

The industrial projects would be centered around the upcoast mill assembled in Europe and now almost ready for shipment to B. C. for assembly. It is hoped that the plant will be ready to produce pipe for the proposed $120 million Trans-Mountain natural gas pipeline from Peace River to U. S. border.

Fifty engineers from Europe will arrive in next few months to start on the proposed projects. Entirely financed under a family trust without a major parent company, the program is headed by Dr. William K. Waller of London, of the Waller Family Trust in England which controls 20 major enterprises throughout Europe, Africa, United States and Canada. Dr. Waller said, however, some promotion of outside capital would be necessary for the $100 million steel project.

$50 Million for Harbor Project in Australia

Plans are being completed to spend $50 million on an inner harbor project at Port Kembla on the southern New South Wales coast, Australia.

Port Kembla is an important steel-producing locality and the harbor project will be synchronized with the proposed expansion of the industry. Australian Iron & Steel Pty. Ltd. has spent $75 million on capital development in Port Kembla since 1949 and immediate expansion projects involve several million dollars.

The harbor project will involve "punching a hole" from the existing harbor into Tom Tom Lagoon and its adjacent swamps and the creation of wharves and marshalling yards. About eight thousand feet of additional wharf frontage will be provided and the development will be in three stages. The first one will provide berths for 14 vessels within four years.

French Nuclear Power

Following the recent statement of French Premier Edgar Faure that France might be forced to produce atomic and hydrogen weapons to maintain her position as a world power, French atomic energy officials have released new information concerning French nuclear progress.

Biggest news was the disclosure by High Commissioner Francis Perrin of the French Atomic Energy Commission that France will have two electric power stations based on atomic energy in operation within the next two years.

The first station, actually for the production of plutonium, will come into operation in early 1956, with full power being reached by July. A small 5,000-kw power station, utilizing the hot air provided from the uranium pile, will be built nearby.

The second pile (also for producing plutonium) will be operating by the beginning of 1957. It is expected to be considerably more efficient in its use of materials due to the employment of a system of heat extraction based on carbonic gas under pressure.

(*International continued on page 75*)

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YEARS SERVICE LIFE TO DATE

BOSTON PUBLIC LIBRARY	67
HOTEL TOURAINE	59
SHERATON PLAZA	43
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CHAMBER OF COMMERCE BLDG.	31

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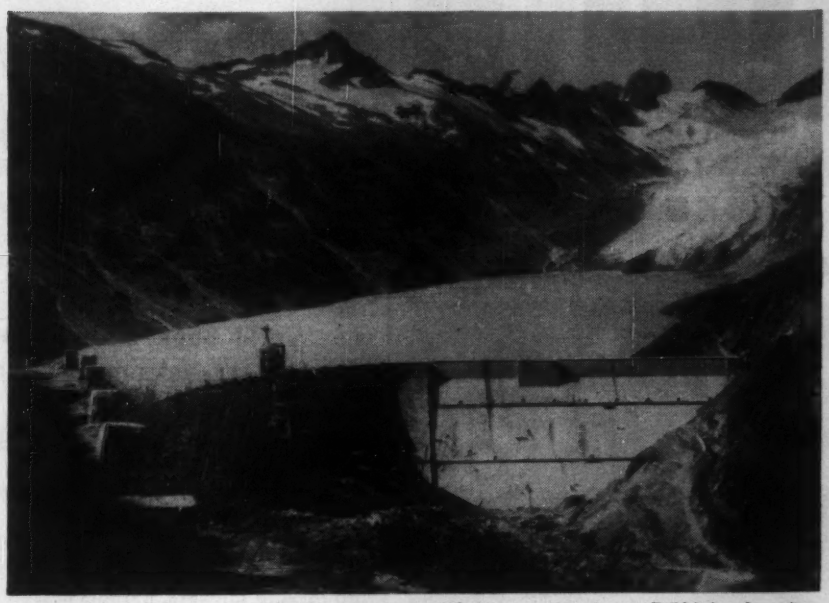


OBERAAR DAM, main structure in Swiss Alpine project is at 7,500-ft elevation.

Pumped Storage

Swiss project for hydro power nears completion

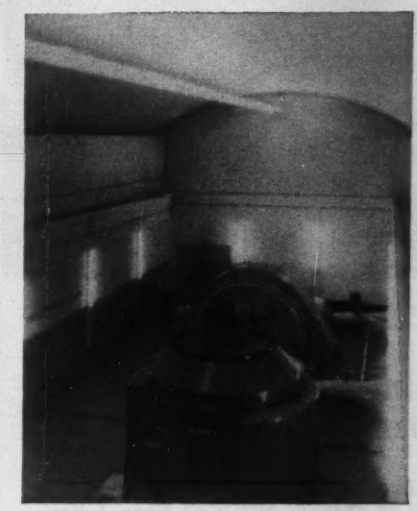
After three years of work in the glaciers of the Bernese Oberland, Switzerland, the pumped storage Oberaar-Grimsel hydropower project was recently completed. The Oberaar reservoir is located at an altitude of about 7500 ft above sea level.

As it can only be two-thirds filled with the waters flowing from its surrounding drainage basin, the rest of its content must be pumped to the reservoir from the 1300-ft lower Grimsel lake to fill it completely for power generation in the winter months. Power is more expensive in winter than in summer in Alpine countries where high altitudes freeze up the flow of water.

Four miles away in rock near Grimsel Lake the underground power station has a 42,000 HP generator run by two laterally located Pelton turbines and is at an altitude of about 5,800 ft. A tailrace conducts the water which leaves the turbines into a lower lake.

Trübten Lake, halfway between Oberaar and Grimsel Pass, was formed by a small dam and connected with the Oberaar shaft. The water tapped from Grimsel Lake for the filling of the Oberaar lake is restored to it by way of water deviated from yet another lake and water flowing from two glaciers.

The underground power station will deliver a yearly increase of 30 million kwh to the electrical network (Oberhaasli System) in the area, but most important it will supply 190 million kwh of summer energy in the power-scarce winter months.



UNDERGROUND power station at Grimsel Pass has 42,000 hp generator.

In order to bring the Grimsel water into the Oberaar lake, a 29,000 hp pump was built in the underground Grimsel Station. The pump delivers 140 cfs against a 1300 ft head.

With the completion of the Grimsel-Oberaar power station the Oberhassli Power System consists of four power stations: Innertkirchen, Handeck I and II, and Grimsel; about 44 miles of tunnels and penstocks, seven accumulation lakes, and a drainage basin of 104 square miles.

The total installation represents a

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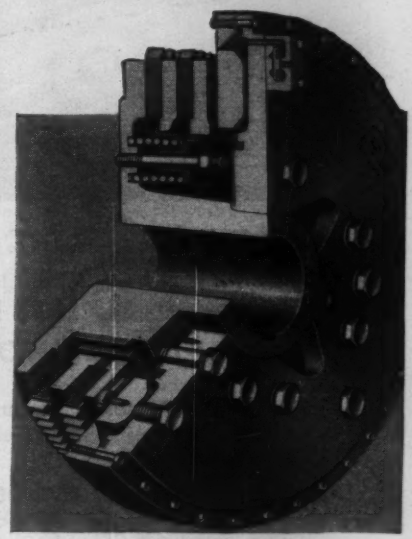

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Foreign Aid

World Bank makes loans for redevelopment work

Last week the World Bank granted a total of $42 million in loans to aid in major redevelopment and irrigation projects in Africa and Peru, respectively.

A loan of $24 million was made to help finance a program to modernize and expand railways, harbors and roads in Kenya, Uganda, and Tanganyika, Africa. Another loan of $18 million was granted to Peru to finance a program to irrigate 125,000 acres of new land in its northern coastal region.

• **African transportation**—The improvement of transport is a matter of high priority in continuing the development of the three African territories that received aid.

The territories lying in East Africa cover an area as large as Western Europe, and have a population of approximately 20 million. While they are independent of each other, they share certain services, of which the most important are transportation and communications. These services are directed by the East Africa High Commission, a statutory administration established in 1948.

Since the end of the war, rail traffic in the territories has grown to double the prewar volume, and the tonnage of cargo handled at ocean ports has more than doubled. This increase in traffic has been caused by a marked growth in export-import trade. Exports (mainly of coffee, sisal and cotton) have increased in amount, and in 1953 were triple the value of exports in 1947. Imports have also grown, partly as the result of rising income, partly to meet import demands left unsatisfied during the war, and partly to bring in capital equipment needed for agriculture, industry, public services and the construction of new housing.

The railways are the main arteries of transportation in the territories; roads and waterways serve primarily as feeders and distributors for the four main lines of the rail system or

as links in the system. Between 1946 and 1953, the ton-miles of rail traffic increased by four-fifths. This put a severe strain on facilities which had been designed for much lighter tasks. The main pressure was from imports, but seasonal peaks in the movement of exports have also presented acute problems.

The three main ports (Mombasa, Dar es Salaam and Tanga), even more than the railways, have suffered from lack of capacity to handle the growing traffic. There has been a large increase in the total tonnage moving through the ports, and a rising proportion of imports has consisted of cargo difficult to handle, such as heavy machinery, structural steel, tractors and the like.

The program being carried out by the Railways and Harbours Administration is designed not only to meet current demands for transport service, but also to create some reserve capacity to deal with the future growth of traffic. The program is expected to be nearly complete in 1957.

• **Peruvian land**—In Peru the $18 million loan will finance a program to produce food and long staple cotton; the consequent reduction of food imports and increase of cotton exports will contribute significantly to the improvement of Peru's trade position.

The irrigation project is located near the town of Piura, the capital of a large and growing agricultural and industrial region, about 600 miles north of Lima. The soils of the area are well suited to cultivation but lack of water for irrigation has heretofore made it impossible to bring the land into production.

The irrigation project is being carried out in two stages. The first stage was undertaken by the Peruvian Government and completed in December 1953. It consisted of the building of tunnels and canals to divert water from the dependable flow of the Quiroz river to the Piura river, an erratic stream which sometimes dries up completely. This diversion system has made it possible to increase the cultivated area in the Piura valley from 37,000 to 77,000 acres.

The Bank's loan will help to finance the second stage of the Quiroz-Piura project. That stage consists of the construction of a dam which will create a reservoir to store water from the diversion canal, and the building of 53 miles of main canals and 200 miles of lateral canals. Water from the new reservoir used in conjunction with water from the diversion canal will be sufficient to irrigate some 125,000 acres of now uncultivated land. Work is scheduled to start in 1955 and the project to be complete in 1958.

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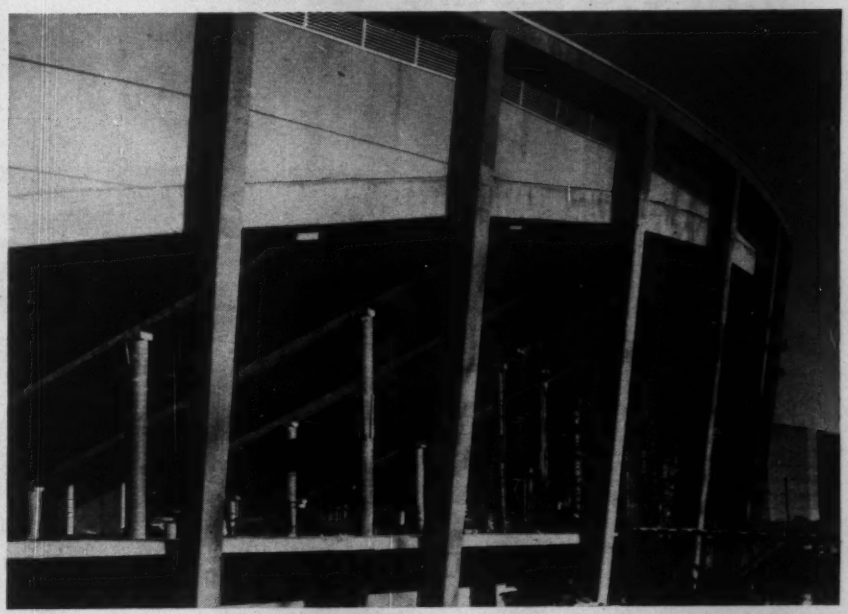

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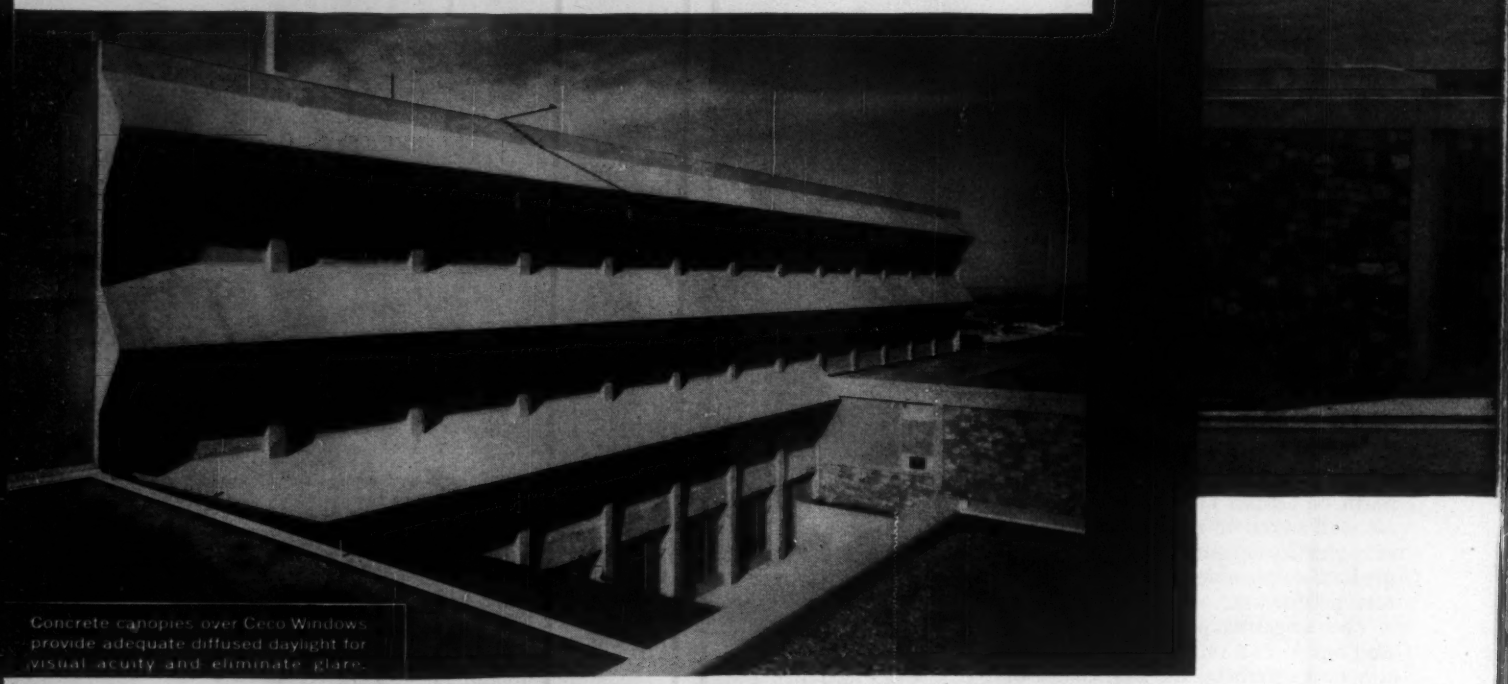
Windows with eyebrows provide glareless daylighting with eye-resting views



Concrete canopies over Ceco Windows provide adequate diffused daylight for visual acuity and eliminate glare.

Architects create a laboratory as rugged as the Rockies — choose Ceco-Meyer Concrete Joist Construction for rigidity . . . for resistance to wind loads and seismic forces . . . for economy

Architects Pereira & Luckman achieved a unique design when they made forthright use of standard products in creating the Radio Propagation Laboratory, U. S. Bureau of Standards, Boulder, Colorado. With the majestic Rocky Mountains as a backdrop, it was fitting that aesthetics be combined with ruggedness, in a functional, fire-safe structure. Imagination accomplishes the unusual in window treatment. Ceco Steel Architectural Projected Windows are positioned in the openings to obtain best diffusion of daylight. Concrete canopies eliminate glare. Clear glass allows occupants to rest their eyes by focusing on distant views. Window types provide optimum ventilation.

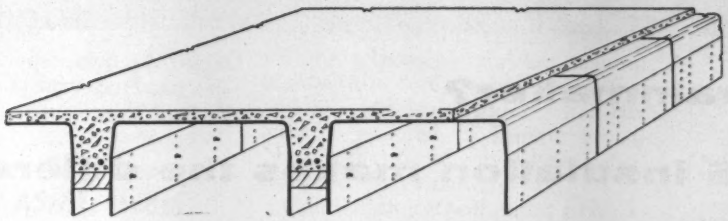
Concrete joist construction was chosen as the best framing method for the building. Less concrete and steel were used than in other monolithic concrete constructions. Reduced deadweight permitted lighter columns and footings. The contractor selected Ceco-Meyer Adjustable-Type Steelforms for the job. The Boulder Radio Propagation Laboratory is another example of Ceco's performance on the architect-engineer-contractor-supplier team. Ceco offers you similar structural engineering and window product services, including erection . . . for *your* next building project. Consult nearest Ceco office or Sweet's files.

CECO STEEL PRODUCTS CORPORATION

Offices, warehouses and fabricating plants in principal cities. General Offices: 5601 West 26th Street, Chicago 50, Illinois

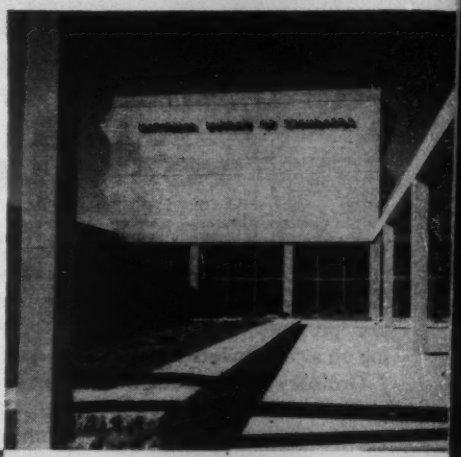
IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

Radio Propagation Laboratory—U.S. Bureau of Standards, Boulder, Colorado; Architects—Pereira & Luckman; Associate Architect—Robert Ditzen; Contractor—Olson Construction Company



Typical arrangement of Ceco-Meyer Adjustable-Type Steelforms, showing simplicity of erection. Proper joist depth is obtained by nailing through selected holes into the soffit form.

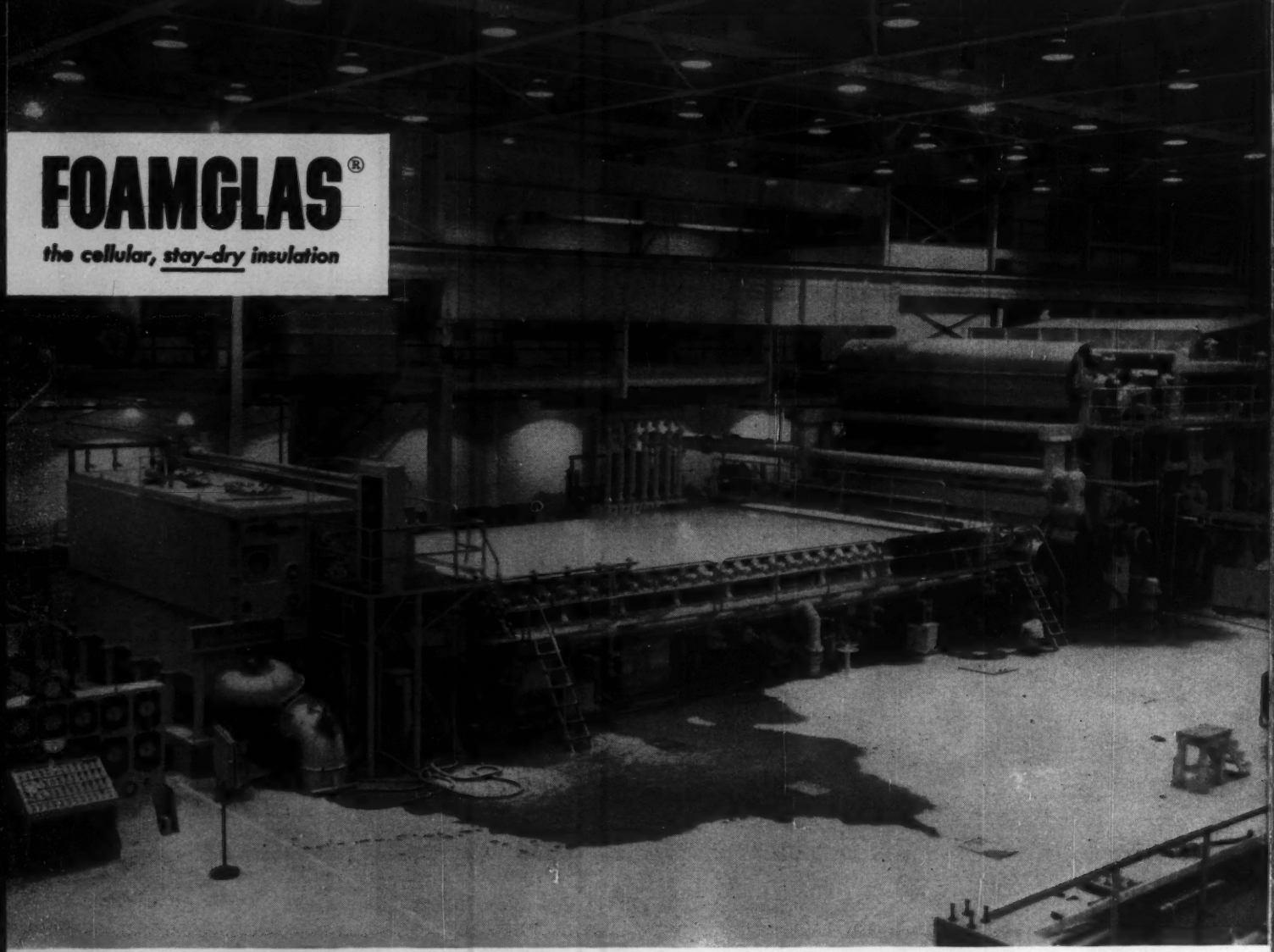
CECO STEEL



Concrete Joist Construction was also used in the roof of the open walkway.

Abundant daylight is provided by window arrangement in clerestory and at work level. Clerestory windows are mechanically operated. Concrete joist ceiling was formed with Ceco-Meyer Steelforms.

DESIGNED AND CONSTRUCTED UNDER THE SUPERVISION OF GENERAL SERVICES ADMINISTRATION, PUBLIC BUILDING SERVICE



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When it's cold outside and hot and humid inside, a paper mill could readily "make rain" . . . unless effective insulation prevents condensation from forming on a cold underside of the roof deck.

Ordinary insulations won't do, because they lose efficiency fast when exposed to the moisture and acid atmospheres prevalent in pulp and paper processing mills. That's why Great Northern Paper Company insulated the roof of this new E. Millinocket, Maine mill with moisture-proof and acid-proof FOAMGLAS.

One of the largest newsprint producers in the U.S., Great Northern has underway a $45,000,000 expansion program which includes several buildings with FOAMGLAS-insulated roofs. They first used this cellular glass insulation four years ago because the rugged Maine winters and high humidities make high resistance to moisture essential for insulating efficiency.

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Consulting Engineers: Stone & Webster Engineering Corp., New York, N.Y. Roofer: Bangor Roofing & Sheet Metal Co., Bangor, Me.

MAE-MB-104,55

M. C. McGough

Merritt-Chapman & Scott Names New Vice President

Merritt-Chapman & Scott Corporation has appointed Myles C. McGough as vice president in charge of the company's industrial and building construction department. He will serve under William Denny, executive vice president and general manager for M-C & C's Construction Division.

McGough came to Merritt-Chapman & Scott in 1936 as a project engineer and 10 years later assumed the responsibility as vice president for the company's industrial and building construction operations. In 1952 he joined Bechtel Corporation, serving as its eastern division manager before returning to M-C & S.

DuPont's Chief Engineer Will Receive ASME Medal

Granville M. Read, chief engineer of E. I. duPont de Nemours & Company, Wilmington, Del., was awarded the ASME Medal "for his outstanding leadership in developing men and in organizing and completing projects of extraordinary national and industrial importance." Presented annually for distinguished service in engineering and science, the award was made this week at the spring meeting of the American Society of Mechanical Engineers in Baltimore.

During his 40 years of service with duPont, Read has been closely associated with the extensive activities of the company's engineering and construction divisions. One of his current projects is the huge $1.3-billion Savannah River Project near Aiken, S. C. (ENR, June 19, 1952, p. 36) now nearing completion under contract with the Atomic Energy Commission. Read is responsible as chief engineer for the engineering and construction of the project, and has gained national prominence for the company's successful efforts in the field of safety.

As head of the company's war construction division during the early part of World War II, Read supervised the erection of 54 wartime ordnance facilities built for the government. Later, as assistant chief engineer, he had charge of the design and construction of major war plants, including the Hanford Engineer Works for the production of plutonium.

Army Engineer To Become Construction Chief Abroad

Col. Charles F. Mitchim, secretary to the Mississippi River Commission and assistant division engineer, Lower Mississippi Valley Division, Corps of Engineers, has been assigned to Supreme Headquarters, Allied Powers in Europe. When the transfer occurs in June, Col. Mitchim will be succeeded in Vicksburg by Col. M. P. Barschdorf.

In his new assignment, Col. Mitchim will become chief of the land and naval installations section in the Paris headquarters of Gen. Albert Gruenther, SHAPE commander. He will be responsible for the planning and construction of naval installations and all land installations other than airfields required in Europe for the North Atlantic Treaty Organization, composed of 14 nations.

Col. Barschdorf will report to Vicksburg after completing the current session of the Army War College. He is a graduate of the U. S. Military Academy and holds an engineering degree from Massachusetts Institute of Technology. During World War II, he served with the Fifth Army in Italy as commander of the 182nd Engineer Combat Battalion. Col. Barschdorf's subsequent assignments included duty as a staff officer on the Army General Staff, and as chief of the military mission to Bolivia.

Another University Joins Combined Education Plan

Colgate University, Hamilton, N. Y., has become affiliated with the Columbia University School of Engineering's "Combined Plan for a Lib-

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eral Education in Engineering." This brings to 44 the number of liberal arts colleges, scattered through 27 states, participating in the program.

Under the "combined plan," a student attends the liberal arts college for three years and Columbia School of Engineering for two years. Upon successful completion of the course, he receives both an A.B. and a B.S. degree.

Purpose of the program is to give future engineers a broader educational background with a thorough grounding in liberal arts. In addition to receiving sound technical training, students are taught clarity of expression and are given an understanding of the responsibilities of citizens and a knowledge of the background of contemporary society.

According to John R. Dunning, dean of the Columbia School of Engineering, "Industry has discovered that such men are more versatile, more able to keep pace with the rapidly changing technology, and capable of better leadership."

District Engineer Named By The Asphalt Institute

The Asphalt Institute has added Lyle E. Martin of Kennebunk, Me., to its engineering staff. Martin becomes district engineer in District One, with headquarters in New York.

A specialist in materials and asphalt engineering, Martin has been associated primarily with airport construction problems. He joins The Asphalt Institute after three years in Greenland as division civil engineer in the construction and maintenance of Air Force bases. Prior to that, he was assistant construction engineer on the Air Force base at Ben Guerir, French Morocco.

After the outbreak of World War II, Martin worked on airport and seaplane base construction in Brazil and in French and Dutch Guiana, was supervising paving engineer in Trinidad, B. W. I., and served as materials engineer during the construction of the Pratt and Whitney airport in Hartford and the New York Municipal Airport at Idlewild. He was later associated with the Civil Aeronautics Administration as airways engineer in charge of paving at Anchorage, Alaska.

Key Engineers Being Listed For National Emergency Use

Engineers Joint Council has undertaken the task of assembling a "Finder's List" of key members of the engineering profession throughout the nation. Included in the list, expected to number about 20,000, will be those in a position to assist in locating engineering talent needed in time of national emergency.

The work is being done in cooperation with the National Science Foundation, Washington, D. C., which has been directed by Congress to establish the National Register of Scientific and Technical Personnel.

Listings by the Engineers Joint Council will not be restricted to engineers represented by the ten major organizations which compose the council. Registration of scientists will be conducted by various scientific organizations and will include all qualified scientists. When completed, the lists will be maintained by the individual organizations, with copies in the hands of the foundation.

Col. W. McWilliams Retires From State Highway Service

Col. William A. McWilliams has retired as chief engineer of the Delaware State Highway Department and has joined Nello L. Teer Co., Durham, N. C. His new assignment will take him to Keflavik, Iceland, as project engineer on air base construction.

Col. McWilliams came to the Delaware State Highway Department in 1920 as an assistant engineer and was appointed as chief engineer in 1947. Two years later, he was named associate director of the Delaware Memorial Bridge, subsequently becoming its director of construction and general manager. In 1953 he returned to the Highway Department as chief engineer.

Walter B. McKendrick, Jr., succeeds McWilliams. McKendrick was formerly assistant chief engineer of the department and is a past president of the Association of Highway Officials of the North Atlantic States.

U. S. Navy Civil Engineer Retires from Active Duty

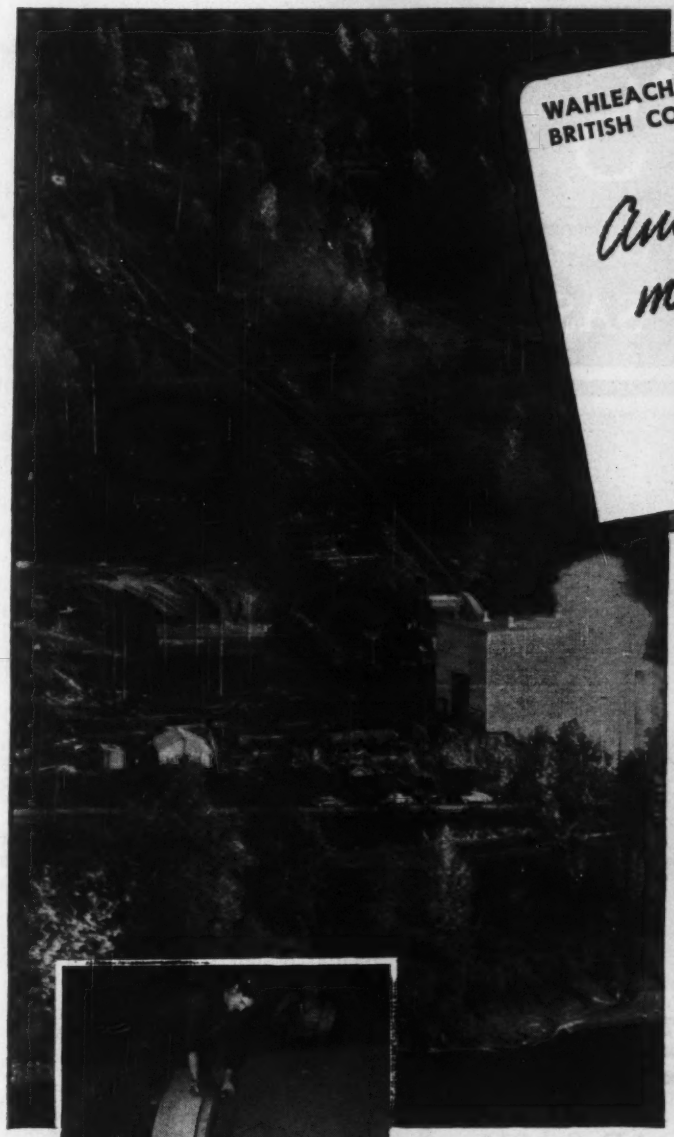
Captain Arthur C. Eberhard, CEC, USN, retired from active duty upon completion of his last assignment as district civil engineer for the First Naval District, with headquarters in Boston, Mass.

After serving overseas in the Civil Engineer Corps in World War I, Capt. Eberhard returned to civilian life and until 1940 engaged in general construction work in private industry. During part of this period, he operated his own construction business.

His service during the last war included assignments at the Naval Air

WAHLEACH,
BRITISH COLUMBIA

Another Penstock job made easier with DRESSER COUPLINGS



Above—Overbends made by 1° deflections at each field joint eliminated shop-made bends and special anchors.

Left—Four men averaged less than four hours making bottle-tight joint . . . 975 psi working pressure, 1500 psi shop test on couplings.

Project designed by B.C. International Engineering Co., Ltd.
Penstock installation by Arrow Transfer Co., Vancouver

Lighter, high-yield steel pipe cuts tonnage, shipping, installation costs . . . speeds completion of 1760-foot Wahleach penstock.

Six weeks after construction began, this 70″ penstock—the fourth Dresser-Coupled installation made by the B. C. Electric Company—was ready to deliver water to a 75,000-kva power plant near Vancouver, British Columbia.

Eliminating extensive excavation, resilient gaskets in Dresser Couplings allowed the penstock to be deflected to the natural contour of the right of way. The lighter weight and longer lengths of high-yield steel pipe meant easier handling, fewer joints and anchors. A field crew of 20 men—with a minimum of skill, supervision and heavy equipment *—Dresser-Coupled 1,000 tons of steel penstock in 21 working days.* Under test, the line proved absolutely bottle-tight.

Dresser Couplings permitted faster completion of the line and assured permanently tight, maintenance-free joints. This resulted in *earlier revenue* from plant operation . . . *uninterrupted service* to power consumers.

BE SURE you get a *better, faster* penstock installation. Put high-yield steel pipe and Dresser Couplings in *your* specifications.

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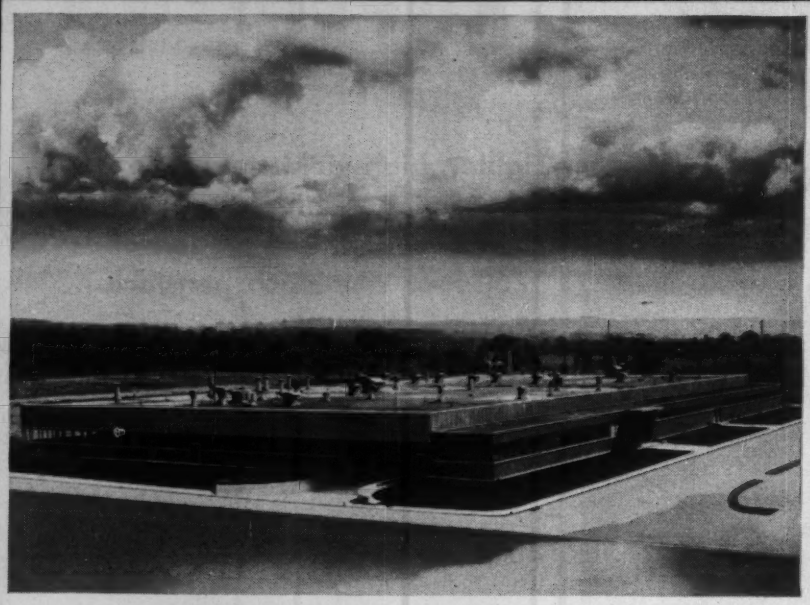

New Super-Precision Plant for the Marlin-Rockwell Corp., Falconer, N. Y.
Wigton-Abbott Corporation, Engineers-Contractors

274 HOPE'S STEEL LOK'D BAR SASH
were used in the construction
of this modern plant.

The greater strength and rigidity of Hope's Steel Windows assure ease of operation and weather-tightness that will last the life of the building. In addition, their greater strength permits long, uninterrupted rows of windows; some of the openings in the building shown are more than 200 ft. long.

For full information on Hope's Steel Lok'd Bar Sash, ask for Catalog 103E.R.

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Station, Corpus Christie, Texas, as construction and public works officer, and in the Bureau of Yards and Docks as head of the Surplus Materials and Equipment Division. Subsequent assignments included overseas duty at Manila, Guam and Paris.

Illinois Tech Names Doblin Director of Design School

Jay Doblin, executive designer with Raymond Loewy Associates, New York, has been appointed director of Illinois Institute of Technology's Institute of Design. He will assume his new duties in September.

His appointment is coordinated with an expansion of the facilities and services of the Institute of Design. Principal step in this direction is the creation of a new academic division of design which will permit inter-use of the facilities of the design school, the department of architecture and a newly formed department of regional and urban planning. The three groups will be housed in a new building, now under construction on the campus of Illinois Tech.

The design school's new director was formerly chairman of the evening school of the industrial design division of Brooklyn's Pratt Institute. Recently he has conducted a private experimental design school, named Studio D, in New York. Among his contributions in the field of design is a system of perspective drawing as a substitute for conventional freehand and mechanical systems.

The Institute of Design was established in Chicago in 1937 by Moholy-Nagy, a Hungarian who developed the basic training courses of the German Bauhaus. It was merged with Illinois Tech in 1949 as a special department.

Materials Specialist Named To Dept. of Commerce Post

The Building Materials and Construction Division, Business and Defense Services Administration, U. S. Department of Commerce, has appointed Sidney Gertler, Alexandria, Va., as commodity industry analyst for metal building materials.

Gertler has recently been special representative and consultant to several companies specializing in builders' hardware, storm sash, aluminum siding, and metal specialties. From 1943 through 1950, he served in various capacities with the War Production Board and the Department of Commerce.

(*Men & Jobs continued on page 86*)

a Weathertight "Wall" with

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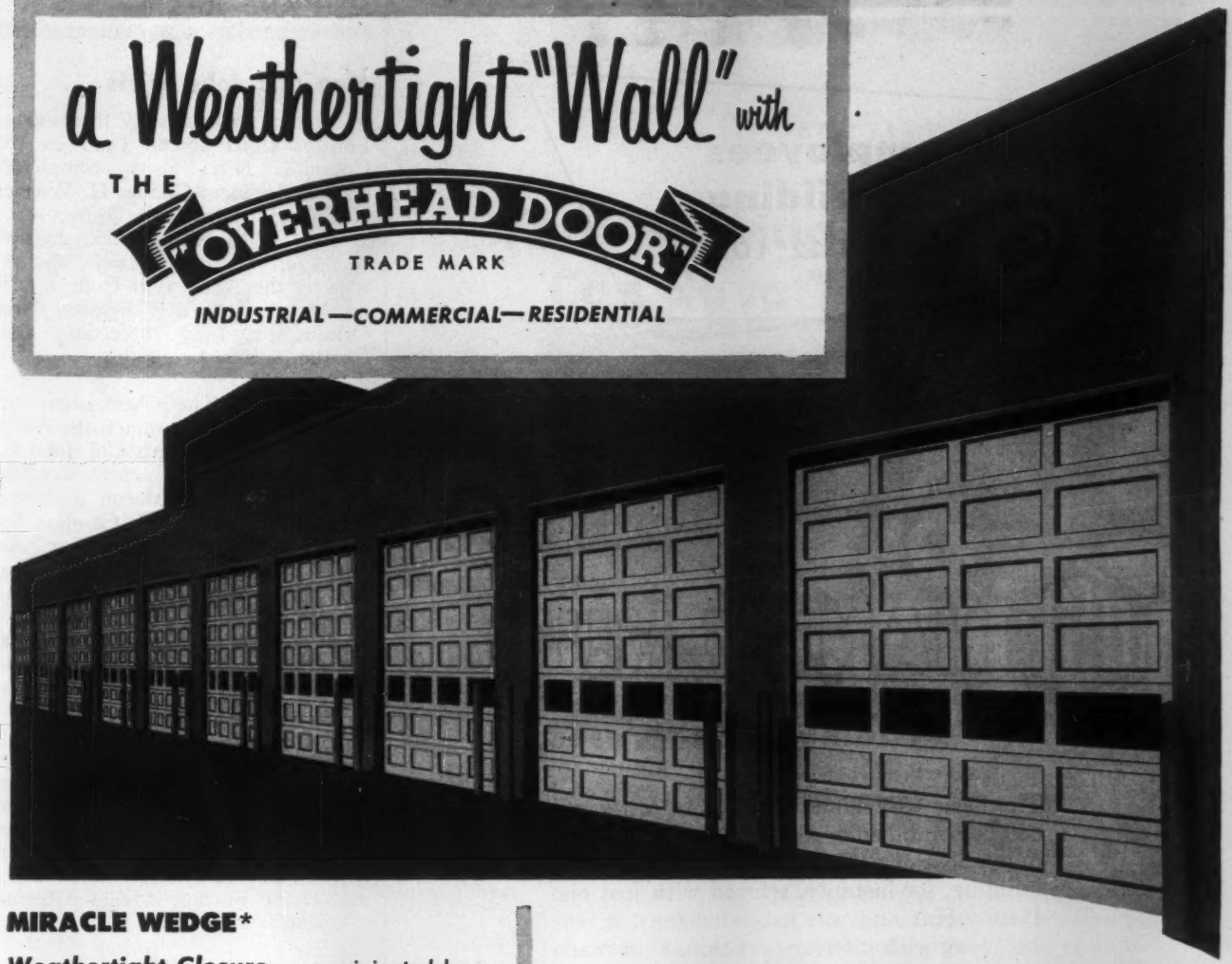

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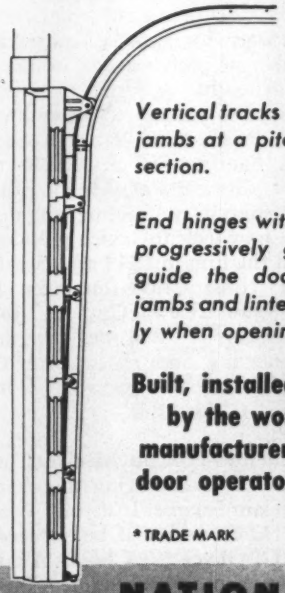

Vertical tracks incline away from jambs at a pitch of ¼" per door section.

End hinges with roller sleeves of progressively graduated height guide the door tightly against jambs and lintel, yet free it quickly when opening.

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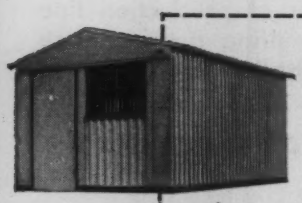

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Men and Jobs Briefs . . .

• **Corps of Engineers**—With construction of Chief Joseph Dam on the Columbia River nearly completed, resident engineer **Charles H. Wagner** is assigned to the Seattle District office as chief of the construction division . . . **Col. William H. Lewis,** now attending the Army War College, will take over as district engineer, New Orleans, in July, succeeding **Col. Charles T. Tench.**

• **Associations**—The Association of Professional Photogrammetrists, Washington, D. C., appoints **Col. John G. Ladd** (USA Ret.) as executive secretary . . . **E. P. Fitts** of Macon is elected president of the North Carolina Society of Surveyors . . . **Roswell G. Smith** of Albert Smith's Sons, Irvington, N. J., takes over as head of The Structural Steel and Ornamental Iron Association of New Jersey . . . **H. S. Merriman,** Socony-Vacuum Oil Co., is elected chairman of the International Road Federation.

• **Careers**—**Charles Tait** of Seattle, Wash., becomes manager and director of the San Francisco Port . . . **William Henry Harrison,** attorney and former Wyoming Congressman is appointed regional administrator for the Housing and Home Finance Agency's Region III, with headquarters in Atlanta, Ga.

• **Business**—**Lewis W. Martin,** vice president and director of Fred W. Entenman, Inc., Toledo, Ohio, contractor, leaves the firm to form his own company, Martin Builders . . . Former FHA official **George S. Brown** is elected vice president and general sales manager for General Industries, Inc., maker of prefabricated homes in Fort Wayne, Ind. . . . **R. C. Nissen** is promoted to assistant chief engineer Southern Pacific Co., San Francisco.

H. A. Saurbrey is elected to the board of directors of Mellon-Stuart Co., Pittsburgh contracting engineering firm; now executive vice president, he joined the firm in 1949 after serving as chief construction engineer for Westinghouse Electric Corp. . . . **John E. Overbeck** is named vice president for engineering and research by Columbia Gas System Service Corp., Columbus, Ohio.

• **Retirements**—**Edward Mackasek** will retire May 1 as managing director of the Porcelain Enamel Institute, Washington, D. C. and will be succeeded by **John C. Oliver . . . Charles A. Halbert,** Wisconsin's chief engineer for 28 years, retires.

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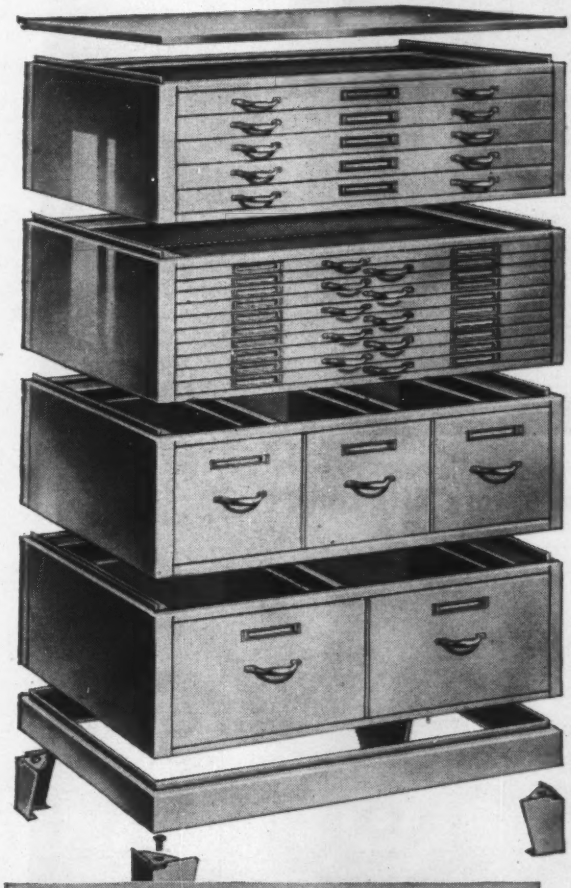

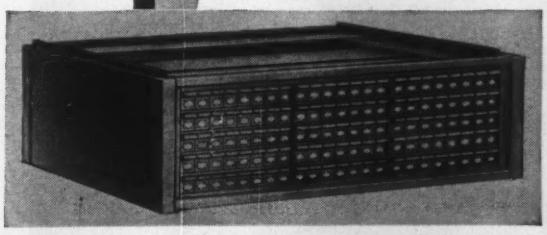

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Material Handling Rigs Are Jacks of All Trades

Since the end of World War II, more and more material handling equipment in the form of fork lift trucks, straddle carriers and pint-sized cranes has been seen on American construction projects. Contractors of all kinds from generals to the specialty men, faced with rising labor costs, have taken to the machines to reduce or eliminate expensive manhandling.

Appearing first in an appreciable quantity in lumber and brick yards, the equipment soon graduated to job sites where it was used for handling building materials in similar fashion. However, it wasn't long before contractors caught on to the fact that they had purchased some fairly versatile pieces of equipment—equipment that with adaptation could serve purposes other than the lifting and hauling of supplies.

On this and the following three pages are examples of how construction men have adopted and adapted material handling equipment to their specific lines of work.

Photo courtesy Clark Equipment Co.

Besides hauling palletized bricks at a building site, fork lifts can . . .

. . . Erect Roof Trusses

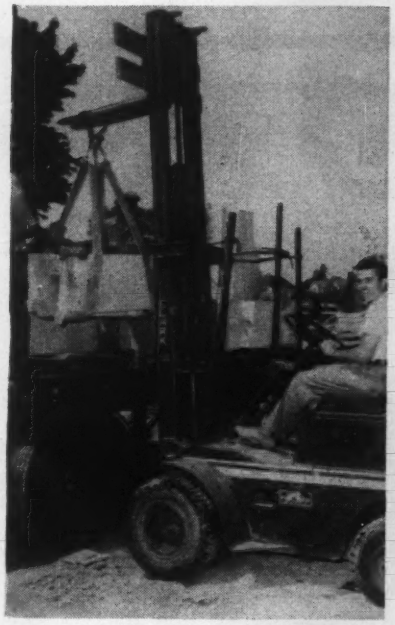
When the Moorman Mfg. Co., livestock and poultry feed producers of Quincy, Ill., built a two story addition to an existing one-story stock room and cafeteria, a fork truck was used to erect the roof trusses.

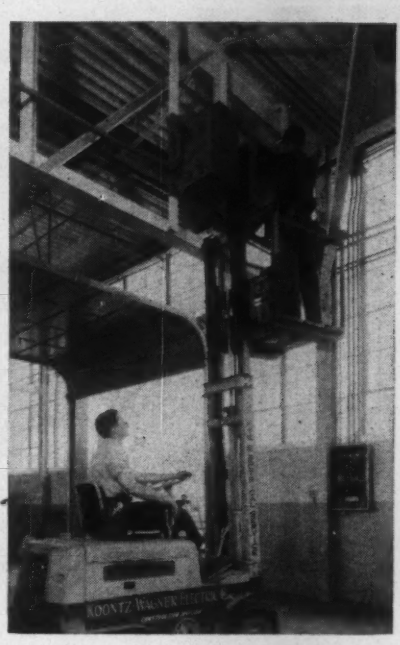
A 10-ft steel beam was clamped across the forks to serve as a rest for the trusses—the lower edge of the truss was placed between the beam flanges. Trusses were loaded by a crane.

When the truss was centered on the beam across the forks it was chained to the frame for safety. The truck was driven over planks set down to distribute the load and the truss was lifted into position. After the operation had become familiar, it took just 12 min to place each of the other trusses.

A crane could not be used to set the 26 steel trusses because of a considerable difference in grade on either side of the structure.

Photo courtesy Clark Equipment Co.





Photos courtesy Clark Equipment Co.

. . . Handle Blocks With Care

The Robert W. Weber Co., Inc. of Philadelphia has saved from 440 to 605 man-hours of labor—on one job—by using a fork truck to handle heavy, fragile limestone blocks.

For this job the fork truck was equipped with a pair of canvas slings suspended from the forks. Two men on the truck trailer guide the slings around three blocks at once. When the forks are raised the stone is swung free and carted to a storage rack made of scrap lumber.

With the fork truck, some 12 tons of stone can be removed from the trailer and stored in 1½ hrs.

. . . Give a Guy a Quick Lift and Wire a Gentle Tug

The Koontz-Wagner Electric Co., Inc. of South Bend, Ind., is using a small fork truck as a mobile scaffold and as a wire puller along with its usual material handling chores.

As a scaffold—a work platform is suspended over the forks—the unit has been used extensively in installing bus duct. Before the truck was used, five men were required for the installation. Two on the scaffold handled the 10-ft duct sections, another two worked the block and tackle while the last man kept them supplied with materials.

With the scaffolding mounted on the forks, two men were required for the upper installation as before but only one man was needed on the ground, and this three man crew did the same jobs in two-thirds the time consumed by the larger crew. Cost figures show that the truck was paid for in the first two jobs.

A smaller 3-ft square platform is used in installing transformers and switchgear and to do overhead work.

The fork truck is also used as a tractor to pull wire through conduits. A cable connects the truck and the wire, and when all is secure, the truck is driven forward in a straight line to avoid undue strains on the wire.

Photo courtesy Hyster Co.

. . . Or Speedily Feed Pavers

Bagged cement can be loaded into a paver skip with considerable savings in time and expense through the use of a fork lift truck.

The Strong Co. of Springville, Utah owns and operates a pneumatic-tired model with 4,000 lb capacity for just such a purpose. When the bagged cement is delivered, the fork truck removes the loaded pallets quickly to release the delivery truck, then transfers the pallets to points along the grade at predetermined intervals.

When the paver is to be charged, the fork truck is called upon again to move the 40-bag loads into the mixer skip.

Two men are required for opening the bags and dumping them. This is the only hand labor needed for this operation.

(*F&O continued on page 90*)

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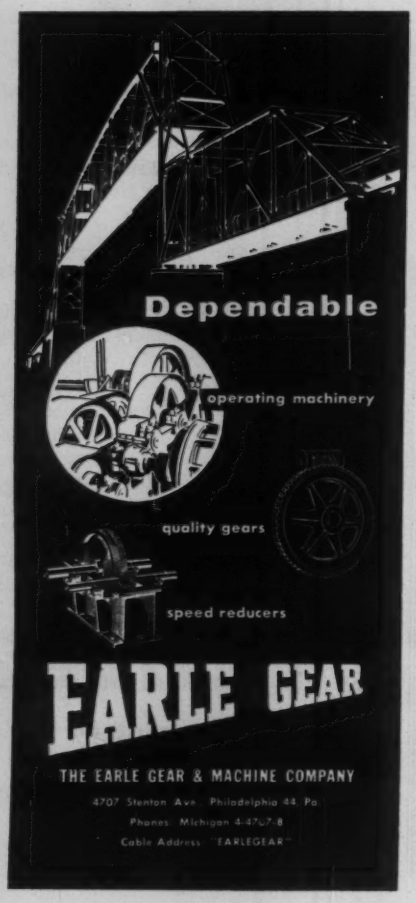


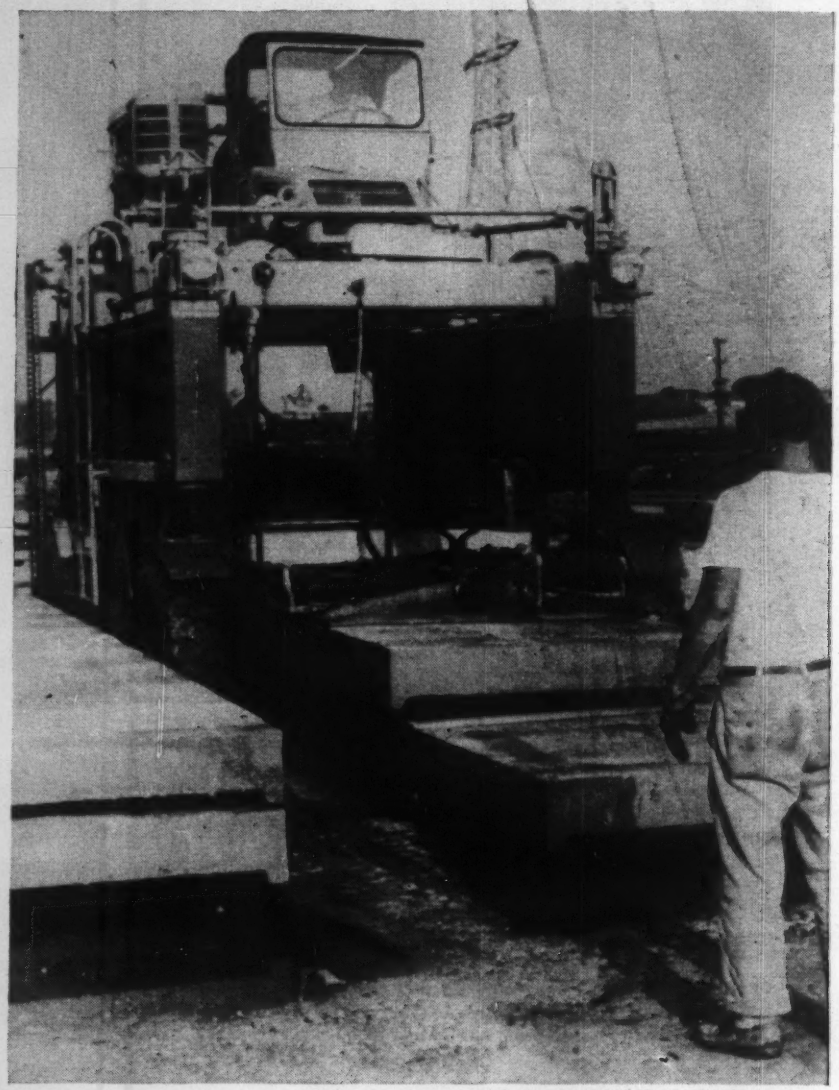


Photo courtesy Clark Equipment Co.

Straddle Truck Handles Precast Slabs

In the construction of three concrete warehouses for the Navy at Great Lakes, Ill., the Corbetta Const. Co. of New York used two straddle carriers to handle precast pieces around the job site.

One 30,000-lb capacity carrier was fitted with a vacuum pump and three 3 x 5-ft lifting pads operated under a 25-in. vacuum. Each pad was sectionalized into three compartments and each compartment could be valved off when necessary. This permitted the handling of any piece, regardless of width, without loss of suction. The pads were slung from a 20-ft steel beam suspended beneath the carrier. Both pads and beam were adjustable so that they could be moved into the best position for picking up awkward pieces.

In operation, the carrier was driven over the form, the lifting pads were dropped into place and the suction started. The pads were then raised with the piece and the carrier drove off to deposit the precast concrete slabs at the storage area.

Castings were removed from the forms in this way after curing for 24 hrs. They were cured another two days in storage and then transported —four at a time—by the conventional straddle carrier to a truck crane for erection.

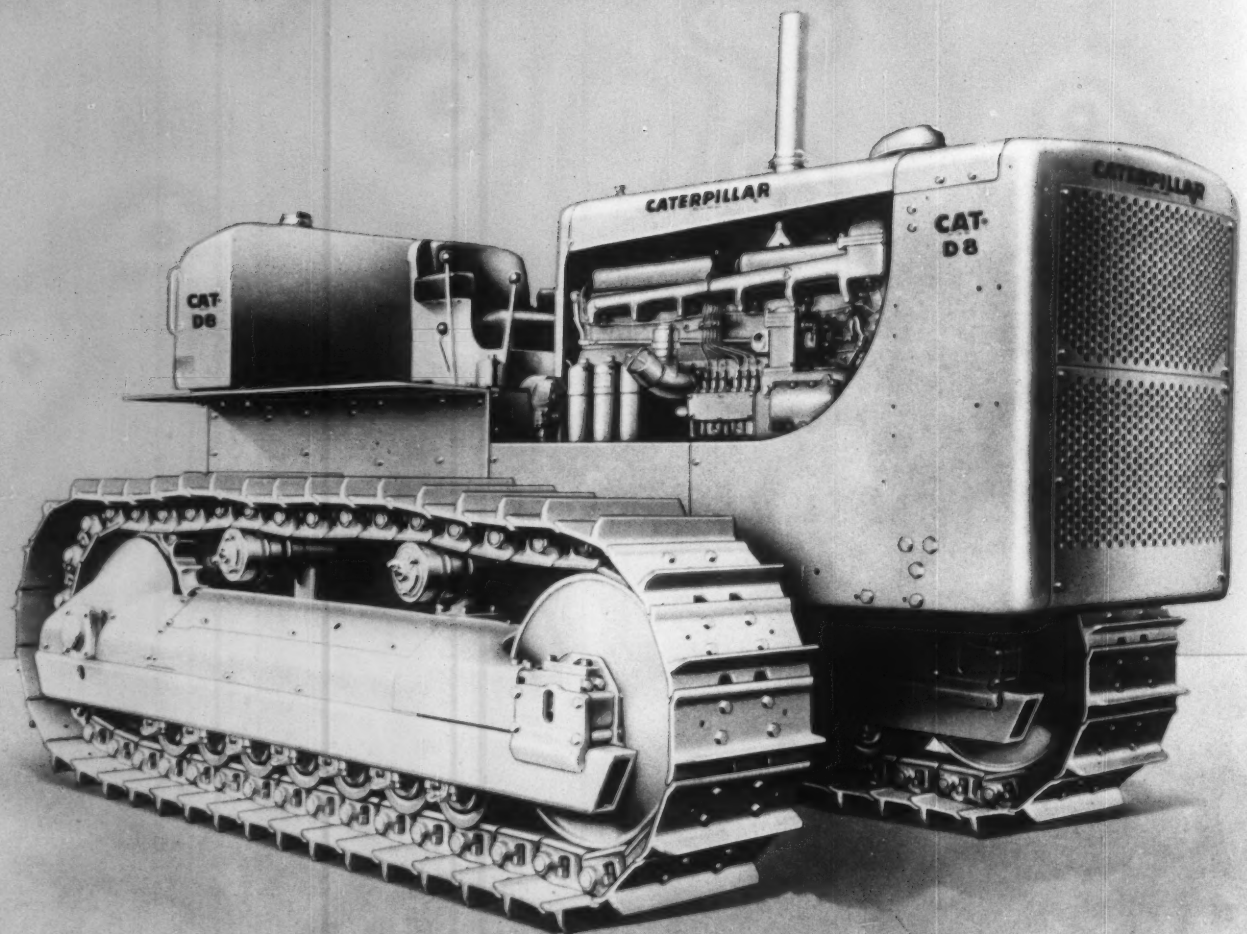
It was estimated that the carriers handled 200 tons of concrete units per day and that using the carriers rather than cranes and trucks on the short hauls saved the company $250 per day.

(*F&O continued on page 95*)

NEW

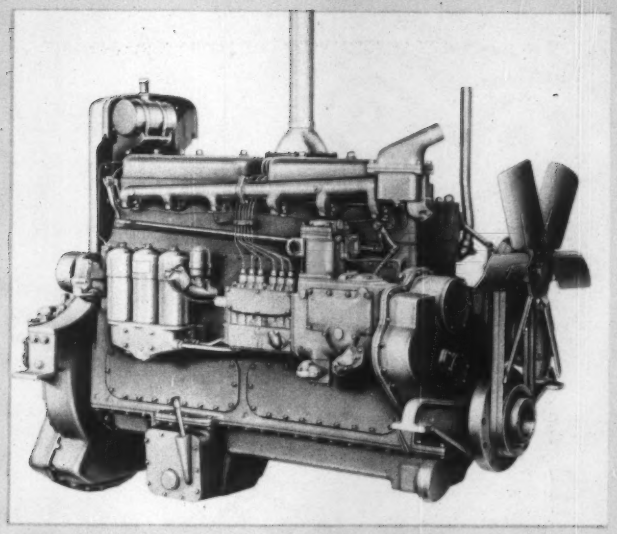
CATERPILLAR ANNOUNCES THE NEW D8

SERIES D and SERIES E

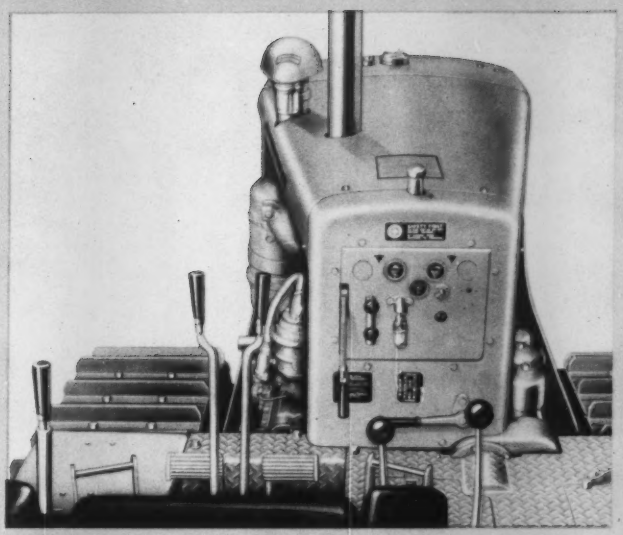


Choice of TORQUE CONVERTER or DIRECT DRIVE

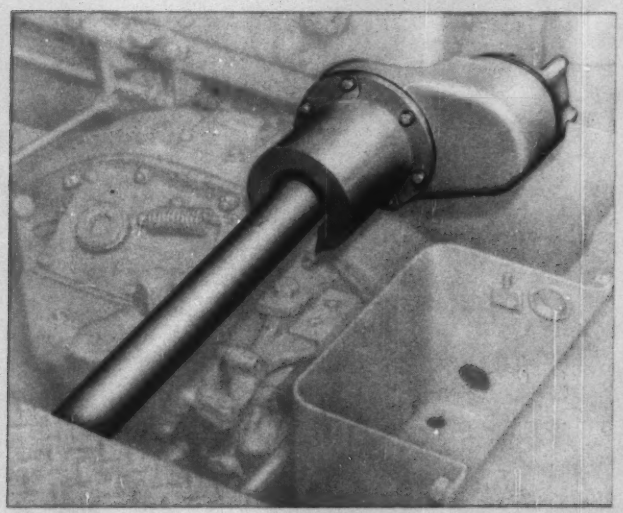
You're looking at a major advance in tractor design—the new Caterpillar D8 Tractor. While it still bears the name of the unit that earned world-wide recognition as "boss of the crawlers," it is basically a *new* machine with 155 HP at the drawbar and your choice of torque converter (Series D) or direct drive (Series E). From its new 7-roller track frame to its new 191-HP, 1200-r.p.m. engine, it is built to deliver an even higher standard of money-making production on *any* track-type tractor application in *any* field. Along with its advance-design features, it retains such outstanding Caterpillar exclusives as the oil clutch and certain other job-proved developments. As a result, you can figure on it for *more* work at *lower* cost with *less* down time on *any* job. For complete information about the new, heavy-duty D8 Series D and Series E, see your nearby Caterpillar Dealer.



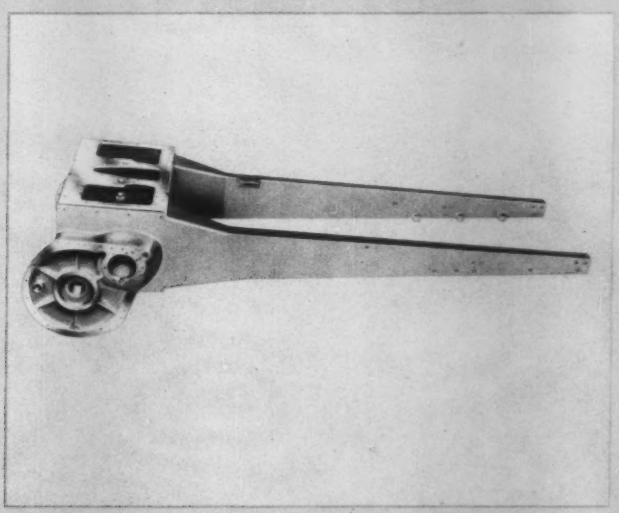
NEW ***ENGINE,*** with new fuel injection system incorporating capsule-type injection valves. Flanged center main bearing to take crankshaft thrust. "Hi-Electro" hardened timing gear integral with crankshaft.



NEW ***EASY-WORKING CONTROLS*** handy to comfortable, one-man seat. The new streamlined hood affords greater visibility. The new easy-to-see instrument panel is attached direct to engine.



NEW ***"LIVE SHAFT" DRIVE,*** independent of flywheel clutch. This important new feature provides constant power for rear-mounted cable controls or other equipment.



NEW ***WELDED ONE-PIECE STEERING CLUTCH CASE—*** main frame assembly for a stronger "backbone." Transmission and steering clutches can be removed without disturbing other parts.

NEW ***OPTIONAL DRIVE,*** torque converter or direct drive, whichever is best for your job. *Torque converter:* torque multiplication of 5 to 1 gives smooth operation in each speed range. 3 forward and 3 reverse: low 0 to 3.6 m.p.h.; intermediate 0 to 5.3 m.p.h.; high 0 to 7.4 m.p.h. *Direct drive:* 5 speeds forward and 3 reverse.

NEW ***7-ROLLER TRACK FRAME*** for greater stability, flotation and better ride.

NEW ***"WATER-QUENCHED" TRACK SHOES*** for longer life than ever before.

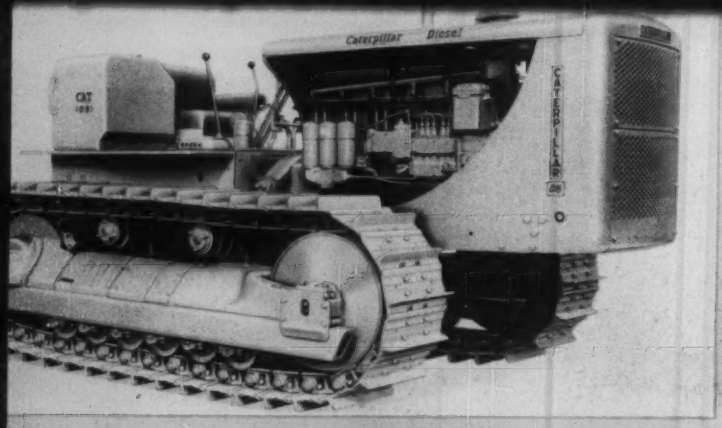
NEW ***HYDRAULIC BOOSTER STEERING,*** pump drive direct from engine, independent of flywheel clutch, for maximum steering ease.

NEW ***STARTING ENGINE*** with more power for faster, surer starts in any weather.

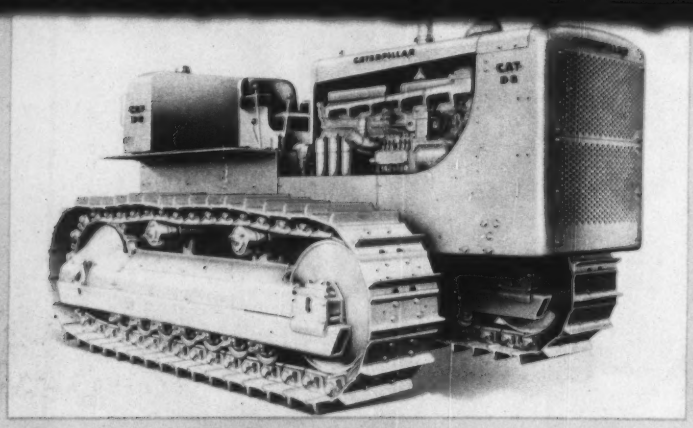
NEW ***"IN-SEAT" STARTING*** for greater convenience.

NEW ***118-GALLON FUEL TANK,*** enough for normal 12-hour operation.

NEW ***ATTACHMENTS*** include cable controls—the new rear-mounted double drum No. 29 with constant power drive direct from engine, and the new front single drum No. 30. New, larger No. 8A and No. 8S Bulldozers, both cable and hydraulic controlled, are also available. The new No. 8U "U"-blade 'dozer has extra strength. Cable-controlled 'dozers use a 6-part line for greater lifting power. All equipment used on the D8 can be used on the new D8 Series D and Series E.



The D8



The NEW D8 Series D and Series E

CHECK THE DIFFERENCE ADVANCE DESIGN MAKES BETWEEN THE D8 AND THE NEW D8 Series D and Series E

	D8	D8 Series D with torque converter	D8 Series E with direct drive
Operating Weight	38,155 lb.	41,265 lb.	40,430 lb.
Ground Clearance	10½ in.	13 in.	13 in.
No. Track Rollers	6	7	7
No. Track Shoes	39	42	42
Length of Track on Ground	99¾ in.	111¾ in.	111¾ in.
Area Ground Contact 22-in. Shoe	4389 sq. in.	4917 sq. in.	4917 sq. in.
Fuel Tank Capacity	98 gal.	118 gal.	118 gal.
Drawbar	Swinging	Fixed	Fixed
Drawbar Pin Size	1¾ in. dia.	2¼ in. dia.	2¼ in. dia.
Steering Clutch	Over center spring booster	Hydraulic booster	Hydraulic booster
Steering Clutch Case	Cast iron. Integral with transmission case.	Steel fabricated. Separate from transmission case.	Steel fabricated. Separate from transmission case.
Transmission Case	Cast iron. Integral with steering clutch case.	Cast iron barrel. Separate from steering clutch case.	Cast iron barrel. Separate from steering clutch case.
Main Frame	Box section bolted to cast case.	Box section welded to steel case.	Box section welded to steel case.

Production-wise and profit-wise, you have a new yardstick of performance in the CAT* D8 Series D and Series E. Your Caterpillar Dealer, source of prompt service, will be glad to show you how this rugged new yellow machine can pay off for you!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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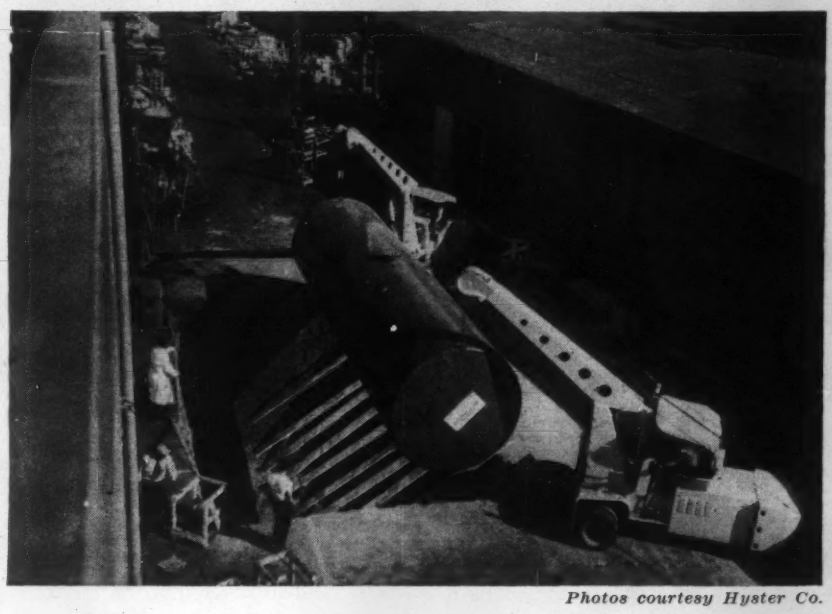
The new D8 Tractor —another example of CATERPILLAR LEADERSHIP in action



Photos courtesy Hyster Co.

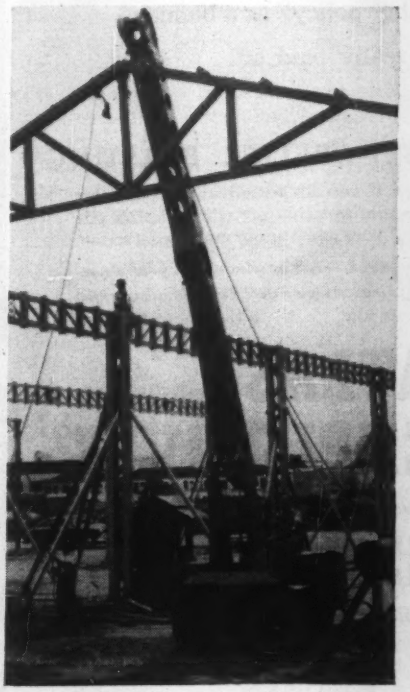
Mobile Cranes Perform Various Duties

Small mobile cranes can be equipped with slings and hooks for the mundane duties of hauling materials around, but they have other uses too.

The two-crane team (above) was used effectively in hauling a 12,000-gal oil storage tank to its prepared site and then easing it into place.

With an extension on the boom, the mobile crane (below left) could be used for setting roof trusses on a warehouse at Sao Paulo, Brazil.

When required, the mobile crant can also double in equipment maintenance work. On the truck mixer (below right) the water tank prevented a straight lift on the drum engine. To exert a straight sideways pull, the cable from the crane was run from the fairlead to the apron and then to the engine mount. When pulling, the crane was moved backward without the necessity of using the hoist mechanism.



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In carving out this section of Philadelphia's "Schuylkill Expressway," Talbott Construction Corp., Winchester, Ky., called every shot *right* using ROCKMASTER millisecond delay patterns adapted to the terrain. The contractor got superior breakage, excellent control, real efficiency . . . plus a "good neighbor policy" as a bonus.

ROCKMASTER really paid off.

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Academy Soil Tests

Field tests get underway with deep pits, compactor

They're being pretty careful with the determination of soil and foundation conditions at the site of the Colorado Springs Air Force Academy. The "they" in this case is the Chicago firm of Skidmore, Owings and Merrill, architect-engineers. The Oklahoma Testing Laboratories of Oklahoma City is under contract to them to run a variety of tests throughout the area where runway, taxi strips, aprons and other portions of the airfield are to be located.

Seven large test pits from 6 to 30 ft deep were dug throughout the area to obtain information on the type of soil and fill material available. A low boy, heavily loaded with sandbags, was driven into the pits to serve as a platform for mounting instruments performing load bearing tests at various depths. In addition, sieve analysis, density and California Bearing Ratio tests were run.

While this work was being conducted in the pit, compaction tests were in progress on the surface. Obtaining soil from a nearby borrow pit, the engineers would spread it over an area measuring 35 x 60 ft to a depth of 1 ft. This area was divided into thirds with one section having optimum moisture content, another being on the dry side and the last wetter than optimum.

After one layer was complete, a crawler-drawn compactor, with a total load of 100,000 lb, made eight passes over the lift to obtain maximum compaction. The process was repeated three times with additional layers of soil until a compacted depth of 36 in. was achieved. Density, sieve analysis, California Bearing Ratio and plate bearing tests were then run in place.

The Oklahoma Testing Laboratories also made 5,000 ft of borings throughout the entire site to obtain soil samples.

The information resulting from the tests will be included in specifications which will be in advertisements scheduled to go out in April for initial bids on the excavating and earthmoving for the airfield site, construction of certain utilities and the road system. The bids are expected to be awarded in May and construction will probably get under way in June.

(*Research continued on page* 98)

Photos courtesy Caterpillar Tractor Co.

SANDBAGGED TRUCK was used to provide solid platform for instruments performing load bearing tests at various depths. Seven pits were dug from 6 to 30 ft deep.

50-TON COMPACTOR was rolled over separate lifts of fill eight times to assure maximum compaction. Motor grader mixed soil and water before compacting passes.

SOIL SAMPLES were removed from the test plots by soils engineers for laboratory analysis. The samples being taken here are to be used to determine grain size.

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WET JOB

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NBS Studies Corrosion of Nickel Cast Iron in Soils

The National Bureau of Standards has recently completed a long-range study of the corrosion of nickel cast irons in soils.

From the standpoint of weight loss and depth of pitting, high-alloy cast iron indicated considerably more resistance to corrosion than either plain cast iron or the low-alloy cast iron. Except in cinders, the deepest pit on the high-alloy specimens was only 74 mils after 14 years of exposure.

In the low-alloy cast irons, additions of nickel up to 3% were found to reduce initial corrosion in poorly drained soils of low resistivity, but this advantage was not maintained for the duration of the tests. Thus, the weight losses of the low-alloy cast irons exposed for the maximum period did not differ greatly from the losses of the plain cast iron. Hence, it would appear that the rates of corrosion of the alloys containing as high as 3% nickel decrease less with time than do the rates for plain cast iron and the alloys containing less nickel.

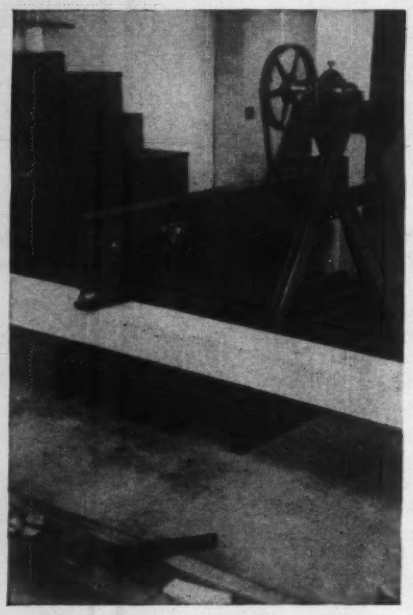
Measurements of hydraulic bursting pressure were also made on samples of the nickel cast irons after exposure to the different soil conditions. Because the original shape and appearance of the metal are retained, visual observation gives no indication of the extent of corrosion in cast iron that has been buried. It is generally recognized that corroded cast iron retains some of its original strength, but the extent to which cast-iron pipe may corrode underground and still retain sufficient strength to withstand the pressures commonly used in water and gas distribution systems had not previously been estimated.

After exposure at the test sites for periods up to 11 years and storage in the laboratory for approximately one year, most of the specimens withstood a maximum pressure of 500 psi, even though the subsequent removal of the corrosion products revealed numerous holes of various diameters.

Most of the low values of bursting strength that were obtained probably were not accurate measures of the strength of the corroded pipe at the time of its removal from the soil since these low values may have resulted from oxidation of the corrosion products during storage or damage to the pipe in handling the shipment. Hence, it is reasonable to assume that undisturbed buried cast-iron pipe, even in an advanced state of graphitic corrosion, is able to withstand the minimum pressure required of class 150 pipe.

The partial results of incomplete field tests of the bursting pressure of undisturbed sections of plain cast-iron pipe are in good agreement with the measurements made on the stored samples.

The study included samples of plain cast iron, low-alloy cast-iron pipe, low-alloy cast-iron plate and specimens of high-alloy cast-iron pipe. Moisture was excluded from the interior by means of cast-iron screw caps of the same composition as the pipe. As an extra precaution against internal corrosion, the inner surfaces of the specimens were coated with heavy grease.



Simple Test Rig Designed

A simple machine for making flexural fatigue tests of prestressed concrete beams has been designed and built by Dr. A. M. Ozell, professor of civil engineering, University of Florida. In two or three days of continuous operation this machine will simulate the effects of 20 years of strains produced by wheel loads up to 10,000 lb passing over a bridge. It will be used in tests being made at the university.

The machine was constructed of steel angles, a 15-in. I-beam, and is operated by a 5-hp. motor. By a simple adjustment of the eccentric, the load factor can be changed from 1,000 lb to any point up to 10,000 lb. The loads are applied at the rate of 180 cpm.

If the beam under test fails during the night or at any time other than when no attendant is nearby, an automatic switch cuts off the operation and an automatic counter shows the number of cycles that had been applied at the time when the failure occurred.

2300 ft. underground

7 Rear-Dumps haul million tons of limestone yearly

Imagine yourself with the problem that faced a large Eastern chemical company a few years ago.

Your plant needs thousands of tons of limestone daily for manufacture into agricultural lime and cement, and for chemical processing into chlorine, soda ash, and other products. Much of your stone has to be shipped in. Transportation prices are boosting your costs.

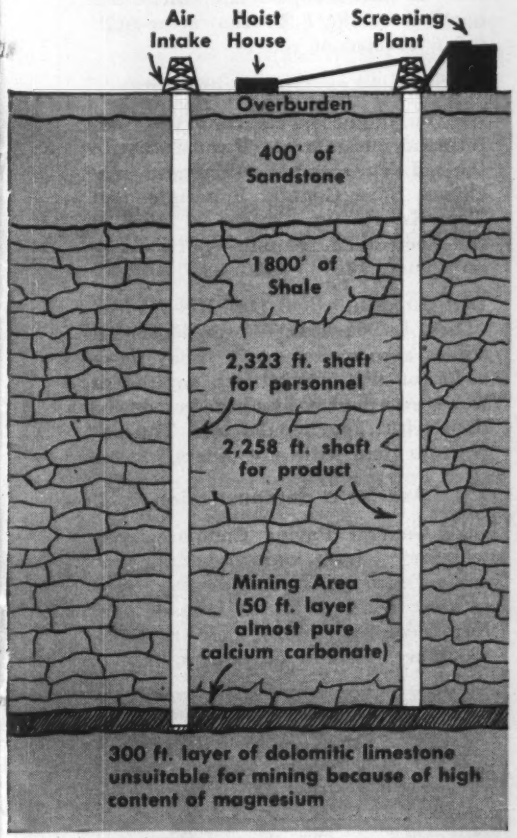

Air Intake
Hoist House
Screening Plant
Overburden
400' of Sandstone
1800' of Shale
2,323 ft. shaft for personnel
2,258 ft. shaft for product
Mining Area (50 ft. layer almost pure calcium carbonate)
300 ft. layer of dolomitic limestone unsuitable for mining because of high content of magnesium

Diagram shows the two 8′ x 17′ shafts. One carries men and equipment, the other brings crushed limestone to the surface. Shafts also carry in 100,000 cubic feet of fresh pumped air every minute. They also take out blasting and diesel fumes. The natural mine air is dry . . . no water drips from ceilings or seeps through walls. Temperature stays 80° year-round. Cave-in dangers are absent . . . strength of the limestone sidewalls, plus arching effect of 2,000 ft. of rock above, eliminates need for shoring or other artificial bracing.

With these difficulties, you'd undoubtedly do what this company did — look for a nearby source. You'd probably never guess what would turn up. Some 2,300′ below your own backyard, under clay, shale, and sandstone, your drills would run into a 50′ layer of almost pure limestone. Satisfactory material, tests showed, for all your needs. But how could you get to it?

Sink two 2300′ shafts

This company answered that question by borrowing some ideas from underground ore and coal miners. First, they drove two 8′ x 17′ steel-and-concrete-lined shafts vertically to the limestone bed. Then, they developed a network of underground roads (now totaling 19.9 miles) to a centrally-located crusher. Next they equipped the mine with 4 electric shovels, 9 drilling rigs, a tractor, 4 loaders, 4 trucks, and a bus to move 80 workers to their assignments.

For hauling, they chose 7 LeTourneau-Westinghouse Rear-Dumps, 16-ton models with bodies built up to hold 20 tons. These units, company officials figured, would be ideal for underground use, because they could turn non-stop anywhere on the narrow 32′ roadways — and their simple rugged construction would reduce repair work.

Assemble machines on mine floor

Then came another problem: how to get these big Rear-Dumps into the mine, nearly ½ mile below? LeTourneau-Westinghouse engineers helped out here. The rigs were shipped to the plant tack-welded. Wheels and prime-movers were separated and lowered down the shaft. Truck bodies, too, were cut apart and lowered. Re-welds and re-assembly were made on the mine floor, and work was started.

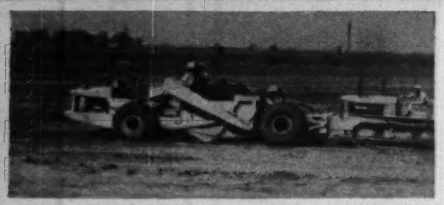
With the 1½-yd. shovels loading well-blasted limestone, each Rear-Dump gets 20-ton heaped load in about 2 minutes. Haul of 3,000′ one way over the level underground roads is made in 2nd and 3rd gear (7 and 13 mph); return in 3rd. The 7 Rear-Dumps average 3,600 tons of limestone per 16-hour day . . . over a million tons per year. Short turns with power steer have proved a major advantage in speeding spots at shovel, for backing to dump into hopper, and for maneuvering in all tight spots.

Another advantage these Rear-Dumps have given is safety. *Each* of the 4 wheels has more braking surface than *all 4* wheels on most haulers. Operators travel confidently at high speeds.

A third advantage . . . there has been practically no downtime for tire troubles on the Rear-Dumps' big single pneumatics. In 4 years of single and double-shifting the 7 units, only one blowout has occurred. Sets of tires have lasted as long as 7,000 hours without recapping, despite the rough pit floor and heavy 20-ton loads. Plant records show over-all mechanical efficiency for all the Rear-Dumps of 96%.

You, too, can lick your hauling problems with LeTourneau-Westinghouse Rear-Dumps. Ask for a demonstration on your job. There's a size to fit your needs . . . 9, 18, 35, and 50 tons.

LeTourneau-Westinghouse Company
PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company
R-664-Q-b



Chain-load to save time

So crawler would not have to waste time backing up after each load, contractors set up borrow pit for "chain-loading." Pusher loaded consecutive scrapers in series through the 600′ to 700′ cut, starting each load where the last one left off. This reduced turning time since 7 to 9 loads could be obtained before pusher had to turn and travel back to the head of the cut.

How General Paving did 11 weeks work in 37 days

GENERAL PAVING COMPANY, Champaign, Illinois, usually use their 2 D Tournapulls for finish work and other small-yardage self-loading assignments. Yet, ample capacity and high working speeds make these 7-yd. "handymen" practical and profitable to fit in with a fleet of larger rigs when the company wants to get more dirt moving on the big cuts.

This versatility proved particularly important to General when they relocated 9½ miles of State Hwy. 45 near Rantoul. Here, 450,000 cu. yds. of hard clay, gumbo, topsoil, and wet sand had to be moved in a few months.

Tournatractor's main job on this contract was leveling and compacting the fill. The 6 sheepsfoot rollers being pulled total 26,400 lbs. Rig also tows equipment, push-loads scrapers, takes out trees, and handles scattered dozing assignments.

In order to meet the tight schedule, contractors started dirt work in late winter with the 2 "D's", 2 larger electric-control "C's", 2 Super C Tournapulls, and a rubber-tired Tournatractor. Bad weather interfered, however. During the first 13 work weeks, the job had to shut down completely for 6 weeks. When the rain and snow finally stopped, contractors put all 6 Tournapulls on production work and the Tournatractor on the fill.

Move 312 yds. hourly

Even then, the going was rough. At the time these photos were taken, loads were being taken from a wet 10-ft. cut that was difficult to enter because of the steep side slopes. Despite this, time studies made on 2-mile cycles show all 6 Tournapulls each delivering 5 to 6 loads per 50-minute hour. On a yardage basis, the two 7-yd. "D's" moved a total of 69 pay yards of clay hourly; the two 15-yd. Super "C's", 111 pay yards; the two 16-yd. electric "C's", 132 pay yards. Combined output: 312 cu. yds.

With this high rate of output, 45% of total yardage was moved in 37 working days! Instead of being way behind schedule, the job was slightly ahead. By the time the job was over, the 4 electric-control Tournapulls had worked so fast they had moved 75% of all dirt. The 2 mechanically-controlled Super "C's" and a fleet of fifteen 5-yd. trucks, working with an elevating grader in the easiest dirt, moved the remaining 25%. Compaction for both scrapers and trucks was handled by the 1 Tournatractor pulling 6 sheepsfoot rollers.

Supt. likes maneuverability

As you might expect from this performance, users are well satisfied with their LeTourneau-Westinghouse machines. Says General Superintendent Tom Kelly, "We like the 90° turn of the electric Tournapulls—particularly on a narrow fill or roadway."

Dirt Superintendent Dan Kelly adds: "These LeTourneau-Westinghouse machines sure operate easy. They move a lot of dirt. Of all the equipment we've ever had, we've had less downtime with Tournapulls and Tournatractors than with any others."

Ask for a demonstration

Like General Paving Company, you will find it pays to include fast, versatile Tournapulls and Tournatractors in your fleet. Get all the facts on performance, prices, and delivery from us today. There's no obligation.

Important Horsepower Changes		
	Former Machines	Present Production Models
D Tournapull*	122 hp	138 hp
C Tournapull*	186 hp	208 hp
B Tournapull	None	293 hp
Tournatractor*	186 hp	208 hp

*Machines on this job are the earlier models

Tournapull—Trademark Reg. U.S. Pat. Off.
Tournatractor—Trademark TDP-688-H-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

High-speed dozers hit of the show

On 17 million dollar Thruway Section

Two Tournatractors are kept busy on this 5,100,000-yard section of the Thruway. Unit above is being used to clean up around shovels and help maintain dumps.

A $17,440,000 contract for constructing 12.8 miles of the New York Thruway—the largest dollar volume dirtmoving contract ever awarded in New York State—has been granted to a combination of 3 contracting firms, Mount Vernon Contracting Company, S. A. Healy Company and M. A. Gamino.

These 3 firms are working in the Ramapo Mountains about 10 miles north of the New York-New Jersey state line. They are moving 1,700,000 cu. yds. of rock and 3,400,000 cu. yds. of common earth. Seven of the 12.8 miles of highway are being carved out of solid rock. Cuts range up to 100 feet deep and 250 feet wide. Nine highway and railroad grade separations must be constructed. Many miles of drainage facilities must be installed. And, the Ramapo River which often has flooded hundreds of acres in the Thruway's right-of-way, has to be diverted and its channel relocated.

Tournatractors speed scattered dozing

While a fleet of Scrapers and trucks is moving the bulk of the yardage, hit of the big job has been 2 rubber-tired Tournatractors which have given Mount Vernon-Healy-Gammino a fast way of handling scattered tractor work.

One of these high-speed machines works for the drilling crew. It strips rock, hauls compressors and wagon drills, backfills trenches, patrols roads to keep them clear of rock, removes trees and brush to prepare drill sites, and handles a wide variety of other scattered dozing and pulling assignments.

The second Tournatractor works in the rock cut, cleans up around 2 shovels, and helps maintain a rock dump. Both units, with their big low-pressure tires, travel anywhere at speeds up to 19 mph — over pavement, tracks, cross-country. With this speed, they often finish an assignment before a crawler could be well on its way. Their tires flex to roll harmlessly over rock which would damage crawler tracks. The tires outwear dual truck tires, too . . . there's no divided face for rocks to wedge in, wear, and tear . . . no thin carcasses to break under sudden strain.

Company's second Tournatractor levels rock from around drill sites, and handles a variety of other pushing and pulling assignments. Operator Maurice LeMay is enthusiastic. "Tournatractors are very easy to run," he says. "Very maneuverable, too. You can get them from place to place in a hurry."

"These Tournatractors," says Foreman Edward Termunde, "are our errand boys. They go anywhere fast . . . haul equipment fast . . . get out stuck trucks fast . . . clean up around shovels fast! I like them very much!"

Ask for more information

By now, you've probably read quite a few reports like this on rubber-tired LeTourneau-Westinghouse equipment. Isn't it about time you checked what these machines could do on your job? Write or call us. We'll be glad to demonstrate the Tournatractor for you.

Tournatractor—Trademark T-607-H-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Here's precision hydraulic control in action — a Bucyrus-Erie Hydrocrane digging footings inside a building for a large press. Note the cramped quarters. Anything but the most exact control could mean damage to walls or ceiling.

Costly Jolts Gone—Fluid Action Hydrocrane Gives Cushion Lifts to Growing Range of Jobs

About seven years ago the revolutionary Bucyrus-Erie all-hydraulic Hydrocrane first demonstrated its almost unbelievable precision control. On one test it lifted, swung and set down a pyramid of six brimful drinking goblets, carried on a 1-ton steel test slab — without spilling a drop of water. Today greatly improved Hydrocranes and Hydrohoes with greater capacity and far faster line speeds are bringing this outstanding hydraulic precision to an ever increasing number of jobs.

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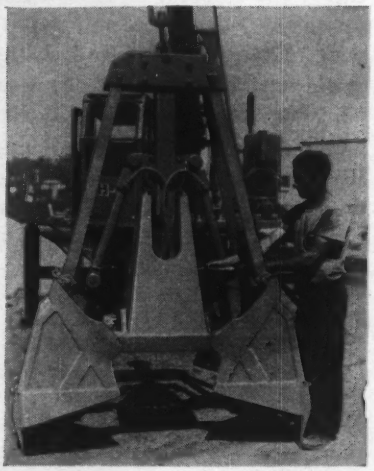
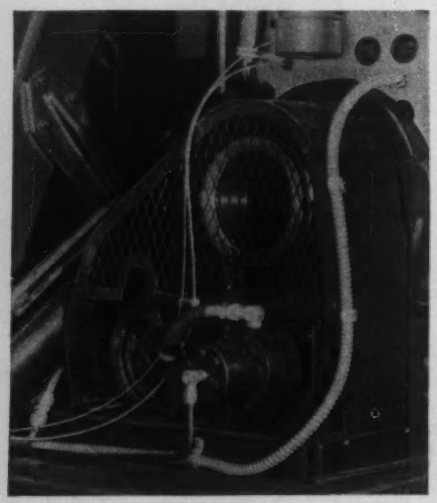
You must *see* a Hydrocrane in action — digging foundations, spotting concrete buckets, erecting anything from steel beams to plate glass — to realize fully the advantages of fluid power and control. Arrange a demonstration now! Write today.



NEW 3/8-YD. CLAMSHELL HAS 42 PERCENT MORE BITING FORCE

This new hydraulically operated clamshell is closed by means of hydraulically operated twin rams instead of a single center ram. This feature plus improved design for greater leverage provides 42 percent more force on lips at point of closing. Bucket is equipped with quick disconnect coupling which can be attached or detached from bucket in a few seconds without tools — and without oil spillage.



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Oral Testimony Admissible To Determine Limit a Cost

In an action by an architect against an owner to recover fees for preparing plans for a house, the owner counterclaimed for a return of money paid the architects. He claimed there was an oral agreement that the house could be erected for $25,000 and that the house for which plans had been prepared could not be erected for less than $40,000. The owner asserted he could not finance a house costing that much.

The contract of employment was prepared by the architect, who used the standard A.I.A. form of contract, and provided for the payment of a fee of 10 percent of the cost of erecting the structure. The contract was extremely vague and was silent as to the style of house to be designed, the number of rooms, and the quality and quantity of materials to be used. The architect claimed that since the written contract did not fix any upset price of construction, he was entitled to collect 10 percent of the cost of building the house even if it cost half a million dollars.

The court held that the written contract was indefinite and uncertain and did not contain all the terms of the contract. The law, is said, is well-established that where a written contract is uncertain, ambiguous or incomplete, evidence of a contemporaneous oral agreement to prove the entire contract is admissible. Whether it was intended to be their complete and final agreement is to be determined from the circumstances.

The court allowed oral testimony showing that the house intended would not cost more than $25,000. The architects' claim was dismissed.[1]

[1]Spitz & Spitz v. Brickhouse, 123 N.E. 2d 117, Appellate Court of Illinois, October 19, 1954.

Owner Must Pay Architect Even If Plans Not Used

An architect is entitled to compensation for services rendered in preparing plans and specifications where they substantially comply with the owner's instructions, even though the owner abandons the project.[1] The court in its opinion stated: "In 6 Corpus Juris Secundum, Architects, Section 4, the text writer states: 'Where the architect prepared plans and specifications for building pursuant to an unconditional order or direction of the owner, he is entitled to recover for his services whether or

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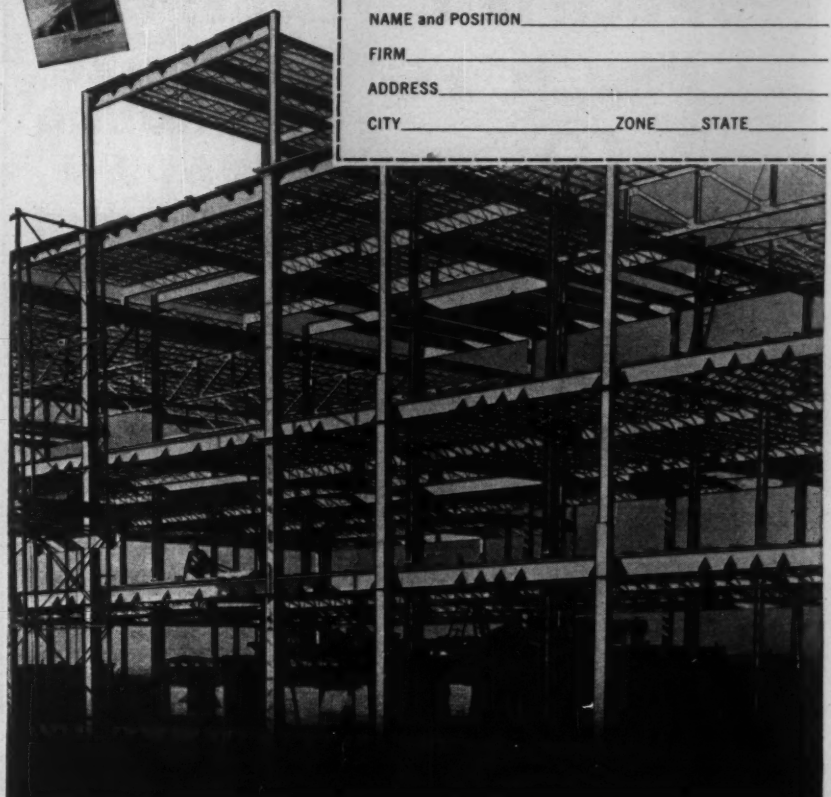

STILL ANOTHER DECISION AWARDED
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Framework for new addition to Jefferson County Fiscal Building, Louisville, Kentucky.

Walter C. Wagner & Joseph H. Potts, Louisville: Architects

Al Schneider, Louisville: General Contractor

Midwest Erection & Conveyor Co., Evansville, Indiana: Erectors

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not the plans are used if they substantially comply with the owner's instructions. So his right to compensation will not be defeated by the fact that the building for which the plans are prepared was never constructed or by the fact that is not such as to render it expedient to build.'"

One of the defenses interposed by the owner was that the architect had never made any delivery or offer of delivery of the plans. The court held that since the owner had notified the architect that it did not intend to proceed with the project, tender of plans would be an idle act.

[1]Doup v. Amand, 207 S.W. 2d 601.

General's Liability to Sub May be Included in Damages

A general contractor brought an action to recover damages resulting from delays and interferences with progress of a project by agents of the State of New York for whom the work was being done. Part of the work was done by subcontractors who sustained damages as a result of the delays and interference. The subcontractors advised the general contractor that they intended to bring suits against it to recover the damages they sustained. The general contractor advised them it was bringing an action against the state to recover damages and was including in its demand for damages the amounts for which it might be liable to the subcontractors. The subcontractors agreed to defer their suit until the determination of the suit brought by the general contractor. The court allowed the general contractor a recovery, including the amounts for which it might be liable to subcontractors, even though it had not paid subcontractors for damages they claimed to have sustained.[1]

The court stated: "It is axiomatic that a suitor cannot recover damages for breach of contract unless he has suffered them. Degnon Contracting Co. v. City of New York, 235 N. Y. 481, 486, 139 N.E. 580. This does not mean that the damages must have been paid. It is sufficient that the liability exists. Cauldwell-Wingate v. State, 156 Misc 901, 283 N. Y. S. 285. Sound reasoning extends to the contractor the right to recover from its defaulting promisor the amount of damages for which it would be liable to its subcontractors, even though it has not actually paid them."

[1]Harry McNally, Inc. v. State, 11 N.Y.S. 2d 577. 170 Misc. 914.

(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)

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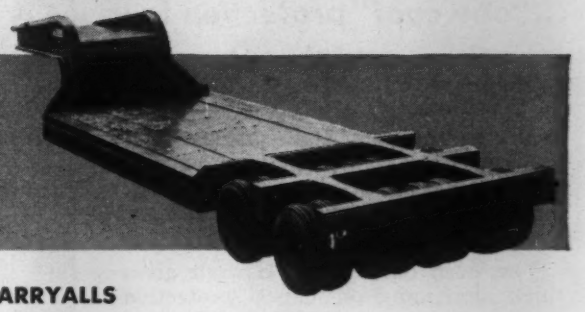

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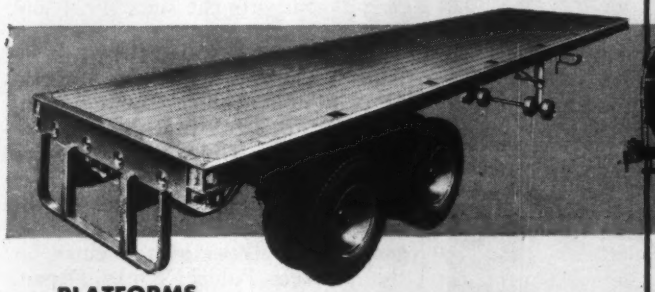

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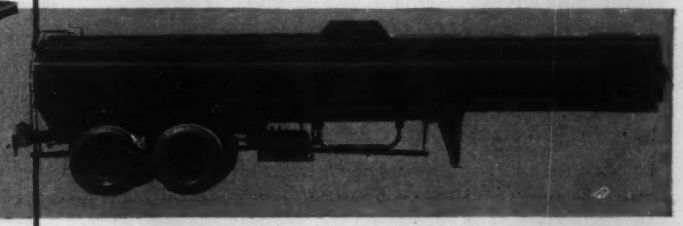

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OBITUARIES

William L. Rockwell, 95, retired civil and agricultural engineer, died March 25 in Houston, Texas. A pioneer in the study of irrigation problems, he served as superintendent of the Buena Vista Reservoir Assoc. from 1898 to 1908, and also was a hydraulic specialist for two companies in the association. In 1919 he studied irrigation problems for the Haitian government and was employed as a consulting engineer for the Haiti West India Corp. Later he was a consulting engineer in Washington and Texas, and worked on irrigation projects for the U. S. Department of Agriculture and the Texas Agriculture Department.

Frederic F. Hall, 79, partner in Hall, Pregnoff & Matheu, San Francisco and Oakland engineering firm, died March 26 in Oakland. A structural engineer, he worked on many San Francisco buildings, including a skyscraper medical building and the Opera House. He received engineering degrees from Cornell University and the University of California.

Ray E. Behrens, 58, Milwaukee County, Wis., planning director, died March 27 in Wauwatosa, Wis. A civil engineering graduate of the University of Wisconsin, he had been with the planning department since 1924 and director since 1950.

James J. Corbalis, 71, former Yonkers, N. Y., Public Works Commissioner, died April 6. After studying engineering at Cooper Union, he went into the contracting business and later joined the engineering staff of the New York Central Railroad. He began his city service as a foreman for the Yonkers Public Works Department, then rose to the post of deputy commissioner. He became commissioner in 1945.

Harold N. Abelson, 47, resident engineer for Tacoma, Wash., City Light on its Cowlitz Dam project, died March 26. As a civil engineer he had worked on many western dams, including Grand Coulee and Nisqually in Washington, McNary in Oregon, Davis in Arizona and Albeni Falls in Idaho.

John H. Myers, 85, civil engineer who served the City of New York from 1900 until retirement in 1934, died in White Plains, N. Y., March 28. He was a division engineer during construction of the New York subway system, and early in his career worked

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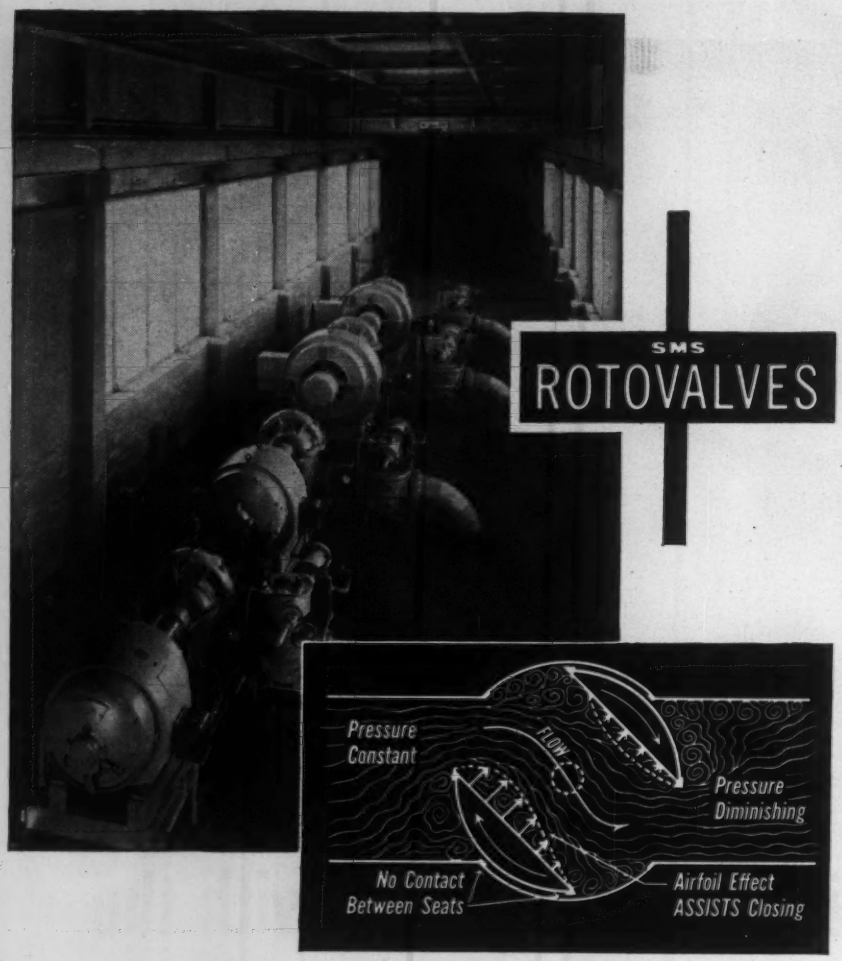

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AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

OBITUARIES

on the Brooklyn water supply system. He was a graduate of the College of the City of New York and Rensselaer Polytechnic Institute.

William S. McConnell, 36, civil engineer of Fayetteville, N. C., was killed April 5 when struck by a cement truck. He was working with Wright Construction Co. on a project at Pope Air Force Base, Ft. Bragg, N. C.

Kingsley D. Lytle, 61, assistant construction engineer for the Oregon State Highway Department, died March 27, in Salem, Ore. He had been with the department for 35 years. Prior to getting the Salem post in 1951 he was highway division engineer in Roseburg, Ore.

Edward B. Abbett, 66, former city manager of Covington, Ky., died April 6. A civil engineer, he served as manager from 1950 to 1952. Until last September he was employed as a consulting engineer in Cleveland, Ohio.

Theodore Human, 74, civil engineer who designed many military airfields in South America and Burma, died in San Francisco March 29. He was a member of the Madera-Mamore expedition to the Upper Amazon 25 years ago.

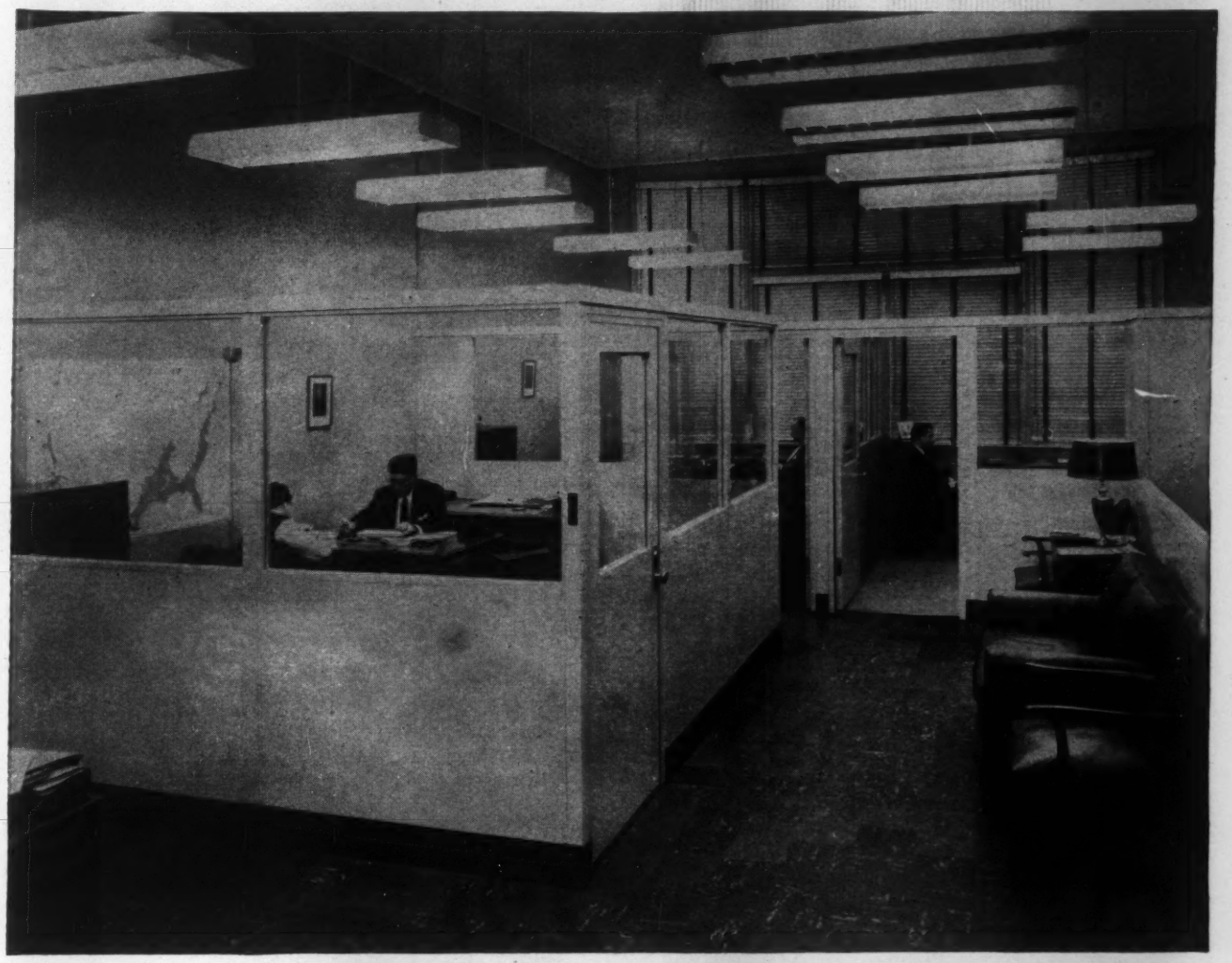
Walter S. Hood, 66, civil engineer who served as coordinating engineer at the New York Naval Shipyard, Brooklyn, during World War II, died in Manokin, Md., April 4. Until retirement in 1953 he was a resident engineer for Lockwood Greene Engineers in New York City.

Herbert N. Read, 60, a civil engineer with the U. S. Signal Corps at Philadelphia, died April 2. A graduate of Pennsylvania State University, he previously was employed for the Signal Corps at Ft. Monmouth, N. J., and by Cheltenham Township, Pa.

Fred Wrampelmeier, 89, retired civil engineer of Cincinnati, Ohio, died late in March. He designed Southern Railway's High Bridge that spans the Kentucky River near Wilmore, Ky.

James E. Henry, 44, civil engineer and surveyor, died April 1 in Dayton, Ohio. He was employed in the supervisory photogrammetric engineering department at Wright-Patterson Air Force Base, Dayton.

Joseph F. Mahoney, 54, an assistant engineer in the Yonkers, N. Y., City Engineers Department, died Mar. 6.



Installation: VMP MOBILWALLS for the Philadelphia Life Insurance Company at 111 N. Broad Street, Philadelphia, Pa.
Contractor: Fleming Company, 1717 Sansom Street, Philadelphia 3, Pa.

"VMP MOBILWALLS helped me meet a tight construction schedule"

Prompt delivery counts. This compliment from Charles J. Fleming, President of the Fleming Company, Philadelphia building construction firm, expresses the satisfaction that contractors feel when they deal with VMP. They can depend on fast deliveries. VMP MOBILWALLS always fit. No time is lost in erection with local VMP crews on the job.

VMP's metal movable MOBILWALLS slash installation time, keep that new look for years. Contractors everywhere are getting the word about the businesslike spirit behind VMP's erection and service crews. And warehouses have big stocks of metal MOBILWALLS available for immediate delivery.

Also, VMP works closely with the contractor . . . bidding with good sharp prices . . . giving expert attention to new and remodeling projects. Get the facts about VMP; write Dept. ENR-2 for VMP MOBILWALL catalog showing the variety of partitions available.

Virginia Metal Products, inc.

ORANGE, VIRGINIA

Subsidiary of Chesapeake Industries, Inc.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Mass., Needham—SCHOOL—BA 4/29—Town, 1330 Highland Ave., 1 story, brick elementary school Highland Park Section. $572,000. Plans deposit $50. The Architects Collaborative, 96 Mt. Auburn St., Cambridge, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston, Zone 16,

Daniel O'Connell's Sons, Inc., 480 Hampden St., Holyoke, Mass. LB **$2,714,414.** Contr. No. 41-040, Westfield River Bridge, Russell and Montgomery. Bids Apr. 5. CD 2/28.

F. W. Cunningham & Sons, 181 State St., Portland, Me. CA Approx. **$600,000.** Fish Freezing PLANT Pew Court and Rowe Square, GLOUCESTER, MASS. Quincy Market & Cold Storage Warehouse Co., 178 Atlantic Ave., Boston, Mass. CD 3/28.

F. W. Cunningham & Sons, 181 State St., Portland, Me. CA Approx. **$500,000.** Fish Processing PLANT, GLOUCESTER, MASS. Quincy Market & Cold Sotrage Warehouse Co., 178 Atlantic Ave., Boston, Mass. Gorton-Pew Fisheries Co. Ltd., 327 Main St., Gloucester, Mass., lessee. CD 2/14.

Beaudry Constr. Co., 142 Hancock St., Springfield, Mass. LB **$627,900,** est. $600,000. Elementary SCHOOL, Southampton Rd., WESTFIELD, MASS. City, Supt. Schools, Broad St., Westfield, Mass. Bids Apr. 1. CD 2/23.

MIDDLE ATLANTIC

BUILDINGS

LOW BIDS AND CONTRACTS

P. S. Edwards Co., Library, Pa., CA **$500,000.** 1 story, 220x320 ft., brick, block, steel anti freeze mfg. PLANT and WAREHOUSE, Plum Twp., near LOGANS FERRY, PA. Penn Glum Oil Co., Leechburg, Pa.

▲ **Consolidated Engineering Co., Inc.,** 20 E. Franklin S., Baltimore, Md. CA **$4,000,000.** petroleum cracking catalyst PLANT, Curtis Bay, BALTIMORE, MD. Davison Chemical Co., Davison Chemical Bldg., Baltimore, Md.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Kentucky**—BA 4/28—U. S. Eng., 830 W. Broadway, Louisville, 2 lock imprvs. at Spottsville and Calhoun and channel imprv. approx. 358,000 cu. yd. earth excav. 80,000 cu. yd rock excav., Henderson and McLean Counties. $1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh,

N. C.—Rea Constr. Co., Box 2015, Charlotte, N. C. CA **$217,652,** est. $200,000-$225,000. structures from point on NC 11 just south of its intersection with US 264, thence north by-passing Greenville to point on NC 11 north of City-County Airport, 1824 F 649 (2), Pitt Co.;

N. C.—Jas. T. Triplett, Inc., Chester, S. C. CA **$168,955,** est. $125,000-$150,000 structures from point on US 70, 1,400 ft. west of White Owl southeast across Country to point at Int. of NC 11 and 55 southwest of Kinston, 2568, S 791 (1), Lenoir Co.;

N. C.—Wm. Muirhead Constr. Co., Durham, N. C. CA **$133,927,** est. $125,000-$150,000. structures from point just south of Ferrell Rd. northeast of Durham northeast to point on US 15 approx. 0.6 mi. southwest of Neuse River Bridge, 4154, IN 663 (10), Durham Co.;

N. C.—Roy M. Homewood, Chapel Hill, N. C. CA **$173,042,** est. $175,000-$200,000 structures from point on US 1 3.5 mi. south of Sanford northeast crossing US 421 to point on US 1, 2.6 mi. north of Sanford, 4504 SF 709 (1), Lee Co.;

N. C.—Foster & Creighton Co., American National Bank Bldg., Nashville, Tenn. CA **$984,571,** est. $400,000-$500,000. structures from point on US 52 approx. 0.7 mi. southeast of Salisbury northeast to US 70, 29 and 52, 6734, IN-FI 708 (1), Rowan and Davidson Counties. Grand total $1,678,147. Bids Mar. 29.

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh,

N. C.—Robt. E. Lee & Co., Inc., Manning, S. C. CA **$153,343,** est. $175,000-$200,000. grading 4.3 mi. from point NC 11 just south of its intersection with US 264, north bypassing Greenville to point on NC 11 north of City-County Airport, 1824, F 649 (2), Pitt Co.; CA **$129,351,** est. $150,000-$175,000. grading 2.25 mi. from point on US 70 1,400 ft. west of White Owl southeast across Country to point at Int. of NC 11 and 55 southwest of Kinston, 2568, S 791 (1), Lenoir Co.;

N. C.—H. F. Ramsey Co., Inc., Box 5146, Asheville, N. C. CA **$156,283,** est. $200,000-$225,000. grading 4.68 mi. from point just south of Ferrell Rd. northeast of Durham northeast to point on US 15 approx. 0.6 mi. southwest on Neuse River Bridge, 4154 IN-663 (10) Durham Co.;

N. C.—Taylor Constr. Co., Asheville, N. C. CA **$358,541** est. $400,000-$500,000. b. conc. 6.09 mi. from point on US 1 3.5 mi. south of Sanford northeast crossing US 421 to point on US 1, 2.6 mi. north of Sanford, 4504, SF 709-(1), Lee Co.; CA **$243,283,** est. $300,000-$400,000. bit. surf. tr. 2.698 mi. in 2 parts on US 19 between Lauada and Bryson City, 9808 F 421 (8), Swain Co.;

N. C.—Mount Airy Grading Co., Mount Airy, N. C. CA **$312,372,** est. $300,000-$400,000. grading 6.62 mi. from point on SS 52 approx. 0.7 mi southeast of Salisbury northeast to US 70, 29 and 52, 6734, IN-FI 708 (1), Rowan and Davidson Counties;

N. C.—Wilson Constr. Co., Inc., Box 603, Salisbury, N. C. CA **$110,081,** est. $100,000-$125,000. grading, bit. surf. tr. 0.795 mi. relocation of NC 150 at Buffalo Creek north of Shelby, 8215 F 693 (3), Cleveland Co.;

N. C.—Blythe Bros. Constr. Co., Box 989, Charlotte, N. C. CA **$473,850.** SABC, bit. surf. tr. 9.7 mi. from point on US 29 near city limits of Grover, northeast to intersection of US 29 and 74, 6 mi. southwest of Gastonia, 8229 F 653 (3), Cleveland and Gaston Counties;

N. C.—Johnson & Geddes, Box 3217, Fayetteville, N. C. CA **$100,888,** est. $75,000-$100,000. subgrade, rein. CABC, S. A., base, b. conc. surf., curb and gutter 1.23 mi. wid'n. resurf. College St. in Clinton from US 701 southwest to east main St. at Sampson St Beaman St. in Clinton from College St. north to Johnson St., BS 3-6-28-144, Sampson Co.;

N. C.—F. D. Cline Paving Co., Box 349, Raleigh, N. C. CA **$91,215,** est. $100,000-$125,000. b. conc. binder surf. 12.72 mi. from west city limits of Selma east through Selma, Micro and Kenly to Wilson Co. line on US 301, BS 4-6-31-173, Code 5900-417, Code 5900-420, Code 5900-434, Johnston Co.;

N. C.—Dickerson, Inc., Box 448, Monroe, N. C. CA **$123,782.** b. conc. surf. type F-2 11.33 mi. US19 from point near Dellwood to Jct. US 23 thence on US 19 and 23 to point in Canton, BS 14-6-94-144, Code 5900-1404, Code 5900-1406, Haywood Co. Grand total $2,252,990. Bids Mar. 29.

Wm. Muirhead Constr. Co., Durham, N. C. CA **$577,000.** reconstruction and restoration of TRYON PALACE, NEW BERN, N. C. Tryon Palace Comn., New Bern, N. C.

▲† **Henry C. Beck Constr. Co.,** First Natl. Bank Bldg., Atlanta, Ga., CA, **$2,161,582,** hangar and shop bldg., Jacksonville Naval Air Station, JACKSONVILLE, FLA. Sixth Naval Dist., Charleston, S. C. Bids Mar. 17. CD 3/24, under LB.

† **F & C Engineering Co.,** Box 4426, Houston, Tex. CA **$538,443.** Bayou Courtableau drainage structures West Atchafalaya Basin Protection Levee, St. Landry Parish, Inv. 55-164, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Mar. 17, awarded Mar. 29. CD 3/30, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Ky.—Warren Bros. Roads Co., 33 Cambridge Parkway, Cambridge, Mass. CA **$816,287.** b. conc. Class I surf. 3.025 mi. Louisville-Inner Belt Line Rd., U 528 (14), SP 56-728 (56-898), Jefferson Co.;

Ky.—The R. B. Tyler Co., 1446 Levering St., Louisville, Ky. CA **$643,275.** b. conc. Class I surf. 2.67 mi. Louisville Inner Belt Line Rd., U 528 (16) SP 56-898, Jefferson Co. CD 4/4, under LB.

Ky.—Southern Constr. Co., Inc., Williamson, W. Va. CA **$87,430.** reconstr., traffic bound limestone 3.257 mi., Chloe Creek Rd., RS 98-403, Pike Co., CD 3/9.

BUILDINGS

LOW BIDS AND CONTRACTS

E. L. Daniels, 1511 N. Quincy St., Arlington, Va. LB **$494,494,** est. $400,000. Crestwood Elementary SCHOOL, FAIRFAX, VA. Fairfax Bd. Educ., Falls Church, Va. Bids Apr. 5. CD 3/21.

▲ **Virginia Engineering Co., Inc.,** 29 St. and James River, Newport News, Va. CA **$2,641,000.** 15 story, bsmnt., sub-bsmnt, concrete STATE OFFICE, RICHMOND, VA. Commonwealth of Va., State Finance Bldg., Richmond, Va. Bids Mar. 28, awarded Apr. 5. CD 4/1, under LB.

† **Thompson & Street Co.,** Pineville Rd., Charlotte, N. C. LB **$849,452.** rehab., constr. Phase III Charlotte Ordnance Missile PLANT, ENG.-31-075 (Neg. 55-5), CHARLOTTE, N. C. U. S. Eng., Customhouse, Wilmington, N. C. CD 10/15.

J. A. Jones Constr. Co., 209 W. 4 St., Charlotte, N. C. LB **$733,800.** Public LIBRARY, CHARLOTTE, N. C. Bd. Trustees of P. Library of Charlotte and Mecklinburg County, Court House, Charlotte, N. C. Bids Mar. 22 CD 3/11.

Keller Constr. Co., 7900 Palm St., New Orleans, La. LB **$709,500** 9 story Maryland CASUALTY BLDG., Common and Dryades Sts., NEW ORLEANS, LA. Louisiana Rettal Improvement Assn., 338 Baronne St., New Orleans, La. Bids Mar 25. CD 3/15.

▲ **Hargett Constr. Co.,** 113 Walton Ave., Lexington, Ky. LB **$2,617,000.** thirteen 2 and 3 story APARTMENTS, 333 units, LEXINGTON, KY. State Div. Purchases, Frankfort, Ky. Bids Mar. 31. CD 3/8.

MIDDLE WEST

BIDS ASKED—BUILDINGS

Mich., Grand Rapids—SCHOOL—BA 4/26—City, Bd. Educ., 143 Bostwick Ave., Hall School. $550,000. Roger Allen & Assoc., 1126 Grand Rapids National Bank Bldg., archts. CD 3/22.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **INDIANA**—Indiana Toll Road Comn., 309 W. Washington St., Indianapolis,

W. E. O'Neil Constr. Co., 2751 N. Clybourn St., Chicago, Ill., LB **$5,486,858.** Contract C-3/4, grading, drainage, structures, rein.-con. paving 1 mi. Indiana East-West Toll Road, City of Hammond, Lake Co. Bids Apr. 6. CD 3/17.

▲ **ILLINOIS**—State Div. Hys., Centennial Bldg., Springfield,

Moore Bros., Inc., 2000 St. Clair Ave., East St. Louis, Ill., CA **$1,332,229,** c. conc. addnl. two lanes 8.25 mi. U.S. 66, Madison and Macoupin Counties. Bids Feb. 25, awarded Apr. 5. CD 3/2, under LB.

Thumm Constr. Co., 4435 N. Damen St., Chicago, Ill., LB, **$195,552,** sanitary sewer addns. and lift station, HOMEWOOD, ILL. Village, Village Hall, Homewood, Ill. Bids Mar. 29. CD 3/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **George A. Rutherford Co.,** 2725 Prospect Ave., Cleveland, O. CA Est. **$2,500,000.** 3 story, masonry, 127,000 sq. ft. INSTITUTE providing 20 studios,

(Continued on page 114)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

Dallas Dennis, G. D. Dennis & Sons, contractors, Portland, Oregon.

"Union Oil products...exclusively for 15 years"

"It's not all mud and rain in the Pacific Northwest, as you can see from this photograph of our equipment working at Dallesport, Washington. Here we had severe dust and sand condition to contend with while building a shoo-fly around The Dalles Dam locks.

"As always, however, Union Oil lubricants protected our equipment... kept our down time to a minimum. This has always been our experience with Union Oil products. We've used them exclusively for 15 years, and in that time we've never had an equipment failure due to faulty lubrication."

Contracting firms all over the West, like G. D. Dennis & Sons, know that proper lubrication with Union Oil products solves many operating problems. Why not let your nearby Union Oil representative supply the lubricants which may well solve some of *yours?*

UNION OIL COMPANY 76
OF CALIFORNIA

Los Angeles: *Union Oil Bldg.* • ***New York:*** *45 Rockefeller Plaza* • ***Chicago:*** *1612 Bankers Bldg.* • ***New Orleans:*** *644 National Bank of Commerce Bldg.* ***Atlanta:*** *401 Atlanta National Bldg.* • ***Kansas City, Mo.:*** *612 W. 47th St.*

Gets back on new slab sooner — speeds paving schedules

KOEHRING 16-E *twinbatch*® paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This *reserve* production capacity with *twinbatch* Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts, bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
Milwaukee 16, Wisconsin

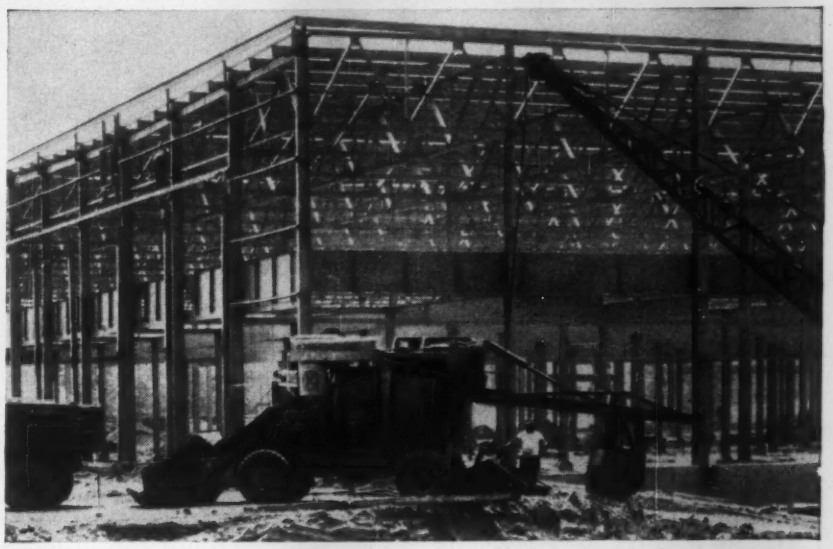
(Koehring Subsidiaries: JOHNSON • PARSONS • KWIK-MIX) 6537

Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E *twinbatch* work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.

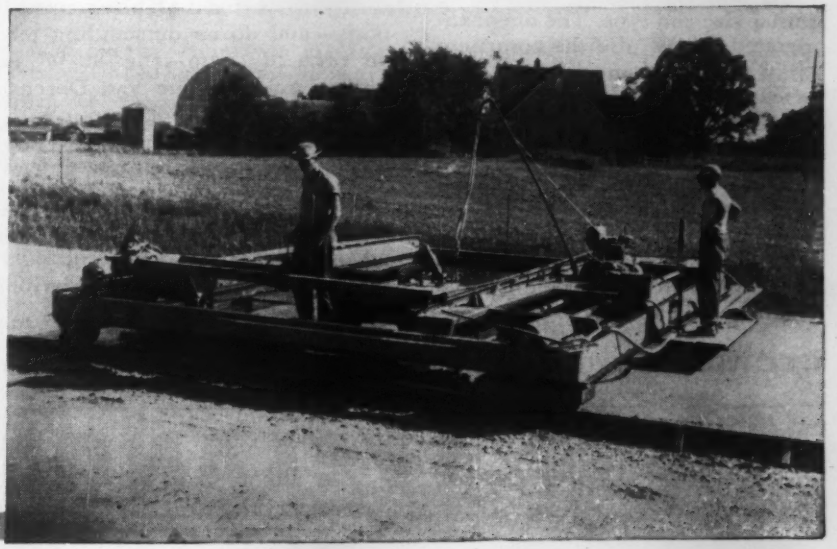
Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E *twinbatch* pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.

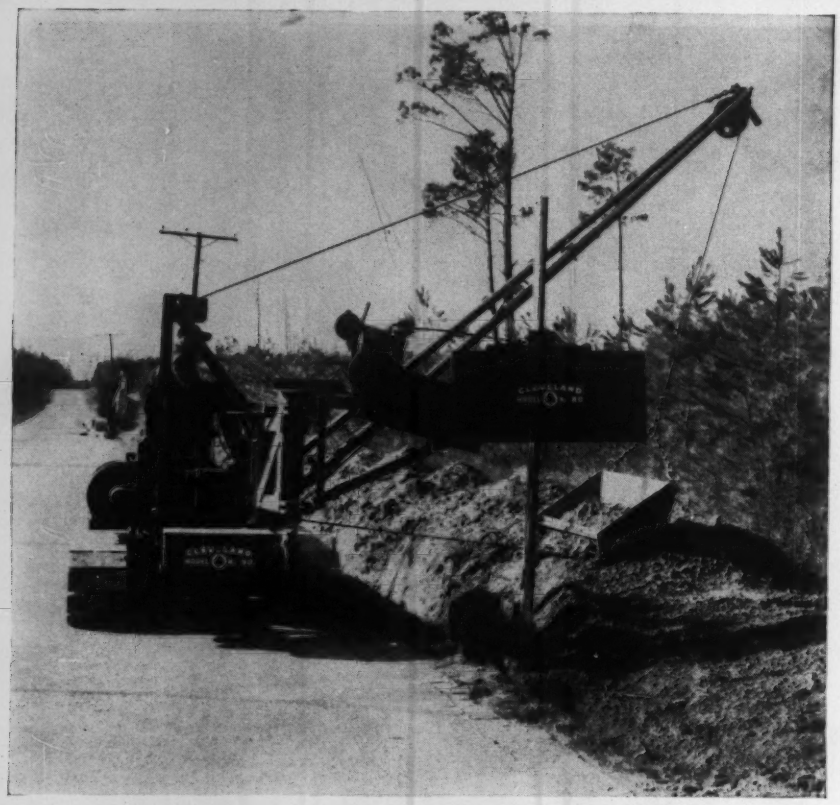


Precision finisher keeps up with any paver

"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



KOEHRING HEAVY DUTY



Saves 6 men, 4 tampers, 2 compressors and small dozer with one-man-operated "80-W"

VAN DOREN BROTHERS of Richmond, Virginia recently backfilled and compacted approximately two miles of trench, 2 feet wide and 4 feet deep, for a 6-inch gas line with just one man and one machine, a Cleveland "80-W" backfiller.

Before the Van Dorens purchased their "80-W" they used 7 men, a rubber-tired dozer, 2 compressors and 4 air-driven tampers for backfilling and compacting on jobs of similar size and type. The one-man-operated "80-W" did the complete job in less time than the 7-man crew formerly required on comparable jobs. "It's a great time saver," was F. M. Van Doren's comment on its performance.

On a previous job their Cleveland backfiller had saved them considerable time and money on a 12-inch water line trench, averaging approximately 6 feet deep, by its unique ability to backfill spoil deposited on a down slope on the far side of the trench, while simultaneously tamping it to the state of Virginia's rigid compaction specifications.

The "80-W" also does an outstanding job of side-crane work, lays pipe, pulls crossings, sets hydrants and valves, pulls sheathing, loads and unloads pipe, etc. Despite its ability to perform all these operations—and do an outstanding job on *each* of them—the "80-W" is easy to operate. The Van Dorens' operator learned to operate it with high efficiency after only two days training on the job.

Investigate this remarkable time, labor and machinery saving tool now—so that you, too, can realize its outstanding benefits on your next job.

See your local distributor for the full Cleveland story or write direct to:

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND

(Continued from page 110)

galleries, shops, kilns Bellflower Rd. and East Blvd., CLEVELAND, O. Cleveland Institute of Art, 11441 Juniper Rd. N.E., Cleveland, O. Garfield, Harris, Robinson & Schafer, 1740 E. 12 St., Cleveland, O., archts. Awarded Apr. 2. CD 7/7/53.

▲ **B & B Constr. Co.**, 1616 Covington St., Youngstown, O. CA Est. **$2,000,000.** concrete block SHOPPING CENTER, at Cleveland Rd. and Sycamore Line, SANDUSKY, O. Realco Plaza, Inc., c/o contractor. CD 11/25/53.

▲ **Forest Heights Corp.**, 4815 E. 32 St., Indianapolis, Ind., Owner Builds, **$1,500,000,** 130 HOMES in Glick's Arthington Blvd. addn. in Forest Manor area, INDIANAPOLIS, IND.

▲ **S & W Builders Corp.**, Plainfield, Ind., Owner Builds, **$1,500,000,** 121 HOMES, Brentwood Heights Addn., PLAINFIELD, IND.

Permanent Constr. Co., 4100 N. 3 St., Milwaukee, Wis., CA Est. **$820,380.** 1 story, 150,000 sq. ft. mfg. PLANT, NEENAH, WIS. Marathon Corp., Menasha, Wis. Bids Mar. 23. (Correction—Owner's name). CD 4/6.

Owen Ames Kimball Co., 38 Pearl St. N.W., Grand Rapids, Mich. CA Est. **$950,000.** MANUFACTURING BLDG. addn. and POWER PLANT, GRAND RAPIDS, MICH. Diesel Equip. Div. General Motors Corp., 2100 Burlingame St. S.W., Grand Rapids, Mich. Argonaut Realty Div., General Motors Corp., General Motors Bldg., Detroit, Mich., archts.

▲ **Ratner Constr. Co.**, 3101 Fourth St., Detroit, Mich. CA Est. **$1,500,000.** SHOPPING CENTER, 22 stores, East Jefferson Ave. and Marter Rd., ST. CLAIR SHORES, MICH. Milton Ratner, 1224 Guardian Bldg., Detroit, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Robert E. McKee General Contractors, Inc.**, 221 Washington Ave., Santa Fe, N. M., LB **$8,662,464,** SAC Control Center, Offutt Air Force Base, ENG-25-066-55-61. FORT CROOK, NEB. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Apr. 5. CD 1/27.

▲† **R. F. Ball Constr. Co., Inc.**, Box 1057, San Antonio, Tex., CA, **$2,325,522,** warehousing, Tinker Air Force Base, ENG-55-63, OKLAHOMA CITY, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Mar. 23. CD 3/28, under LB.

† **Nolan Brothers, Inc.**, 1210 Builders Exchange Bldg., Minneapolis, Minn, CA, **$950,647,** north warm-up pad, apron stub service, etc., Carswell Air Force Base, ENG-41-443-55-98, FORT WORTH, TEX. U. S. Eng., Box 1600, Fort Worth, Tex. Bids Mar. 29. CD 4/5, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Kealy Constr. Co., CA **$508,000.** SCIENCE HALL and FINE ARTS BLDG., HASTINGS, MINN. Hastings College, Hastings, Neb. Bids Mar. 31. CD 3/18.

H. O. Mikkelson, 20 W. 59 St., Minneapolis, Minn. LB $503,959. general contract HEATING PLANT for St. Paul's campus, ST. PAUL, MINN. Regents of University of Minnesota, Admin. Bldg., Main Campus, Minneapolis, Minn. Bids Apr. 6. CD 3/16.

D'Arcy Leck Constr. Co., 2838 Stevens Ave., Minneapolis, Minn. LB Est. **$600,000.** general contract CLUB HOUSE at site, ST. PAUL, MINN. Town and Country Club, 2279 Marshall Ave., St. Paul, Minn. Bids Apr. 1. CD 3/16.

▲ **L. J. McNeary**, 8421 Gravois Rd., Affton 23, Mo. Owner Builds. **$1,042,966.** one hundred and seventeen 1 story, 24x40 ft., frame, brick DWELLINGS, in Tara Plot No. 2 subdivision in St. Louis County, AFFTON (ST. LOUIS 23 P.O.), MO.

Fruin-Colnon Contg. Co., 1706 Olive St., St. Louis 3, Mo. CA Est. **$700,000.** 3 story, bsmnt., 100x201 ft. brick, rein.-con. WAREHOUSE addn., ST. LOUIS, MO. Rexall Drug Co., 3915 N. Kingshighway St. Louis 15, Mo. John A. Thompson, 1706 Olive St., St. Louis 3, Mo., archt.

S. P. Shakofsky Constr. Co., 6601 Delmar Blvd., University City 5, Mo. LB **$645,831.** general contract brick, rein.-con. Ames Elementary SCHOOL, 2900 Hadley St., ST. LOUIS, MO. Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., St. Louis 1, Mo. Bids Mar. 31. CD 3/16.

Walter Nashert, 16 N. E. 27 St., Oklahoma City 5, Okla. CA **$519,000.** HIGH SCHOOL addn., CAFETERIA, N. W. 50 St., OKLAHOMA CITY, OKLA. Bishop E. J. McGuiness, 801 N. W. 50 St., Oklahoma City, Okla. Palmer & Valberg, 1323 N. Robinson St., Oklahoma City, Okla., archts. Awarded Mar. 28. CD 9/12/51.

FAR WEST

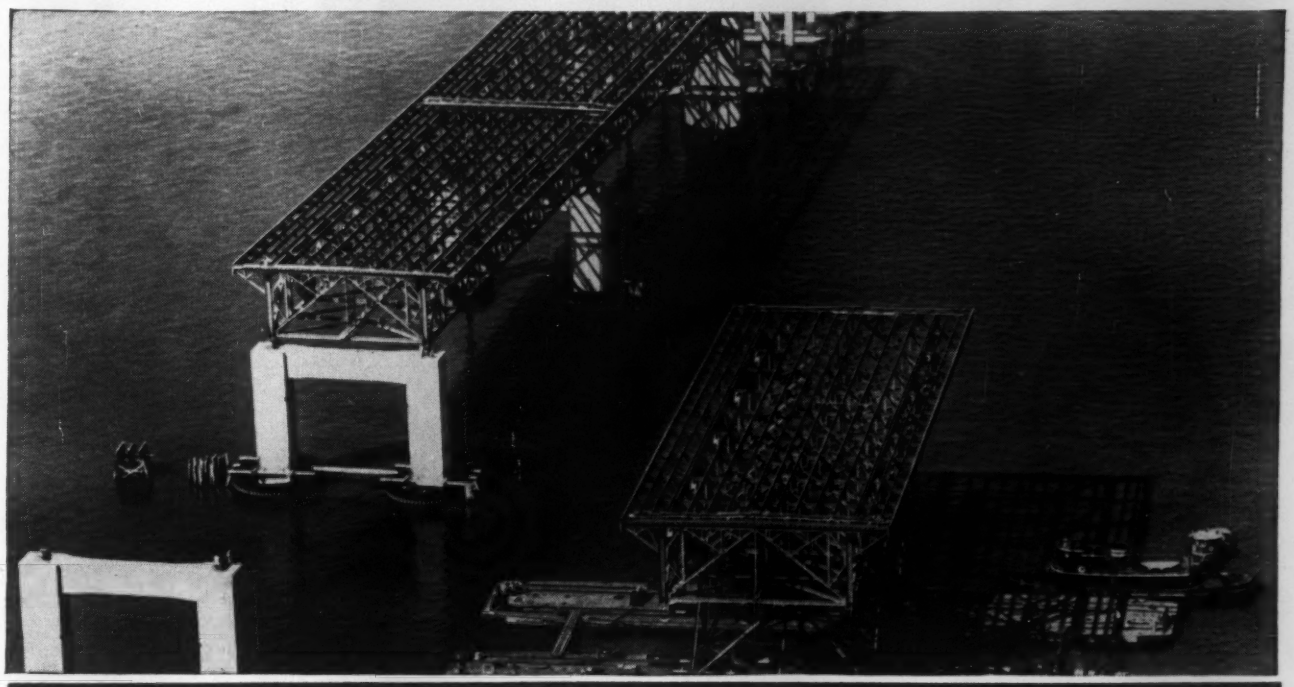
BIDS ASKED—BUILDINGS

Calif., Westwood—SCHOOL—BA 5/5—Westwood Unified School Dist., Westwood, Evaline Welker Junior-Senior High School. $900,000. Plans deposit $100. Clayton Kantz, foot of Butte St., Redding, Calif., archt. CD 2/3/54.

SOON LETS CONTRACT—BUILDINGS

▲ **Calif., Muroc**—FLIGHT TEST FACILITY—Douglas Aircraft Co. Inc., 3855 Lakewood Blvd., Long Beach, soon lets contract flight test facility for engineering flight test operations at Edwards Air Force Base. $1,000,000. Austin, Field & Fry, 2311 W. 3 St., Los Angeles, archts.

(Continued on page 116)



Two-way protection for $60,000,000 Hudson River Bridge with Pittsburgh's X-L-O STEEL PRIMER

1 Safeguards steel shapes against corrosion during shipment and erection

2 Provides excellent foundation coat for field painting

ONE OF THE important links of the New York-Buffalo New York State Thruway is the $60-million Hudson River Bridge between Tarrytown and South Nyack, N.Y., which is to be ready for use later this year. This important portion of this new highway comprises nineteen 250-foot units, such as those shown above, and a 1,212-foot main span and 602-foot side spans for a main-channel cantilever bridge. Spans for this bridge are being fabricated and erected by the American Bridge Division, United States Steel Company.

Structural shapes for this great new viaduct are being safeguarded against corrosion during transit and erection with Pittsburgh's new X-L-O Primer. This unusual product also reduces risk of surface failures that necessitate premature cleaning and painting. New X-L-O Primer also serves as an excellent foundation for final coats. It is available in combination of red lead and iron oxide, or can be supplied with 100% red lead if desired. You can get IRONHIDE or METALHIDE top coats in a range of colors suitable for field painting. For additional information write, phone or wire Pittsburgh Plate Glass Company, Industrial Sales Division, Pittsburgh, Pa., or the factory nearest you.

PITTSBURGH PLATE GLASS CO., Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Torrance, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Michigan. Thresher Paint & Varnish Division, Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

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Setting steel tunnel supports with hydraulic jacks saves time and money...

● **What's Going On Here?**—Look how these heavy steel crown rib tunnel segments are raised and held in exact position with 20-ton hydraulic jacks until the complete rib is in place and bolted together. One man governs the action of these jacks by operating remote control valves. If unstable ground conditions should be encountered another set of jacks can be quickly set up to provide immediate support to the roof, sides and face until the next rib can be advanced and set. Spacer angles bolted between the ribs locate and tie the ribs together into a composite labyrinth. Shallow-depth formed steel lagging plates bolted to the outside of the ribs furnish protection from spalls and provide a surface to support back packing.

● **What This Means for You**—Using the hydraulic jack method requires fewer men in the erection crew and ribs are set into place faster—erection cost is less. Erection equipment takes up less space because these jacks telescope into such a low shut height in their closed position and space in the heading of a tunnel is really at a premium. No stoppage in the mucking operation is necessary while the bore of this tunnel is being trimmed and the steel supports set. The whole cycle in driving and supporting the heading is speeded up and this means additional savings.

"Commercial", with a background of years of experience, designs and furnishes complete tunnel support systems using the strength of steel in its most efficient treatment. No matter which steel tunnel support products are recommended—ribs, lagging, spacer angles, wall posts and beams, liner plates, hydraulic jacks—because they are all made by "Commercial" you may be sure of a system that gives you the lowest cost benefit of every ton of steel used.

The Commercial Shearing and Stamping Company, Youngstown, Ohio—Chicago, Ill.—Salt Lake City, Utah.

COMMERCIAL
shearing and stamping

(Continued from page 114)

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Hadden Stewart Co.**, 712 E. 9 St., Tucson, Ariz., CA $673,370 est. $1,000,000, Air Force station, M-92, ENG-04-353-55-112, TUCSON, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 30, awarded Mar. 31. CD 4/6, under LB.

▲ **Lembke, Clough & King**, Box 1391, Las Vegas, Nev. CA **$1,365,353**, est. $1,500,000. addnl. facilities access apron, base maintenance hangar, etc., Nellis Air Force Base, ENG-04-353-55-117, LAS VEGAS, NEV. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. CD 4/6, under LB.

Lembke, Clough & King, Box 1391, Las Vegas, Nev. CA **$73,300.** sewage treatment plant addns., alterations, LAS VEGAS, NEV. City, City Hall, Las Vegas, Nev.

† **Lembke, Clough & King**, Box 1391, Las Vegas, Nev. LB **$903,176.** air force communication station, TONOPAH, NEV. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Mar. 18. CD 2/28.

† **English Electric Co.**, 230 Beaver St., New York, N. Y., LB, **$470,965,** furnishing three 103,300-kva transformers for Chief Joseph Dam powerhouse, Inv. 55-42, Bridgeport, WASHINGTON, U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 1.

Butler Constr. & Eng. Co., 3419 13 Ave. S. W., Seattle, Wash., LB **$473,355,** est. $425,000. reconstruct central wharf at Pier 20, East Waterway terminal at creosoted piling and timber, SEATTLE, WASH. Port of Seattle, Bell St. Terminal, Seattle 1, Wash. Bids Apr. 4. CD 3/21.

▲ **R. A. Wattson Co., W. E. Kier Constr. Co. & Alex. Robertson Co.**, Joint ventures, 12550 Saticoy St., Los Angeles, Calif., LB, **$2,405,904,** lower feeder and Santiago Lateral, Yerba Linda, Orange Co., LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles, Calif. Bids Apr. 6. CD 3/22.

† **AL-Co.**, 5423 Flemish Village Lane, Los Angeles, CA, **$551,610,** est. $500,000 missile assembly bldg., Edwards Air Force Base, ENG-04-353-55-103, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 25. CD 3/2.

▲ **George A. Fuller Co.**, 3100 W. 8 St., Los Angeles, Calif., CA **$4,990,584,** test facility 1A, Edwards Air Force Base, ENG-04-353-55-72, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 29, awarded Mar. 31. CD 4/4, under LB.

† **Stolte, Inc.**, 1541 N. Foothill St., Pasadena, Calif., CA **$825,699,** est. $500,000. airmen's dormitories, Edwards Air Force Base, ENG-04-353-55-109, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 24, awarded Mar. 31. CD 3/31, under LB.

Williams & Burrows, 500 Harbor Blvd., Belmont, Calif., CA **$994,300,** sewerage treatment plant, SUNNYVALE, CALIF. City, City Hall, Sunnyvale, Calif. L. Pollard, Sunnyvale, Calif., city engr. CD 2/10/54.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Macdonald Bldg. Co.**, 1517 S. Tacoma Way, Tacoma, Wash., LB **$550,297,** post STOCKADE and GUARDHOUSE, INV. 55-150, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 5. CD 3/10.

▲ **Center Inc.**, 536 W. Commonwealth St., Fullerton, Calif., Owner Builds. **$1,165,600.** 94 stucco DWELLINGS, Broadway and Brookhurst Sts., ANAHEIM, CALIF. CD 3/3.

Greenhaven Development Co., 1001 S. Fremont Ave., Alhambra, Calif. Owner Builds. **$690,000.** 75 frame, stucco DWELLINGS, Cienega, Groverdale and Tudos Aves., COVINA, CALIF. Harold B. Zook, 2736 Walnut Ave., Pasadena, Calif., engrs.

B & V Building Co. 5921 S. Western Ave., Los Angeles, Calif., Owner Builds, **$635,000.** 55 frame, stucco DWELLINGS, 10 and 11 Sts., LANCASTER, CALIF.

▲ **Arthur Pinner, Jr.**, 9510 S. Main St., Los Angeles, Calif., LB, **$1,070,484,** Central Receiving HOSPITAL, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Mar. 30. CD 3/15.

Altmans Constr. Co., 1560 W. Monterey Pass Rd., Monterey Park, Calif., CA. **$800,000,** 12 STORES, 2250 S. Atlantic St., MONTEREY PARK, CALIF. Atlantic Square, 1215 Westwood Blvd., Los Angeles, Calif. H. L. Gogerty, 3123 W. 8 St., Los Angeles, Calif., archt.

Hunny Investment Co., 9026 E. Las Tunas, Temple City, Calif. Owner Builds, **$590,000.** 59 stucco DWELLINGS, Albott St., Eaton Pl. and Browning Ave., POMONA, CALIF.

John Jacobsen, Rt. 3, Box 612, Sacramento, Calif., CA **$500,000,** first unit of SHOPPING CENTER, SACRAMENTO, CALIF. Roland Federspiel, Mills St., Sacramento, Calif. Rickey & Brooks, 2015 J St., Sacramento, Calif., archts.

Wm. Rohbacker, 116 W. 3 St., Santa Ana, Calif., CA **$825,106,** JUNIOR HIGH SCHOOL, SANTA ANA, CALIF. Santa Ana School Dist., 1415 French St., Santa Ana, Calif. Bids Mar. 25. CD 3/15.

Leo J. Shanahan & Sons, Inc., 15630 Crenshaw Blvd., Gardena, Calif., CA **$459,000.** 51 frame, stucco DWELLINGS, Miller Rd. and Raritan Dr., WHITTIER, CALIF. Alondra Investment Co., 15630 Crenshaw Blvd., Gardena, Calif.

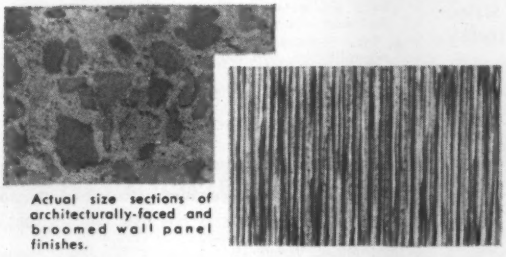
CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Alta., Edmonton**—BA 5/2—City, Civic Block, Edmonton, sewage treatment plant on east side of

(Continued on page 118)

insulated precast concrete wall panels . . . in rich colors and modern textures



Actual size sections of architecturally-faced and broomed wall panel finishes.

From blueprint to final building there's a whole new area of design possibilities when you use MARIETTA concrete wall panels with attractive architecturally-finished stone facings. This means that architect and builder can now combine the modern beauty of natural stone with the time-, labor- and cost-saving advantages of precast concrete panels for modern curtain wall construction. MARIETTA precast wall panels for curtain wall construction are thermally-efficient, easy to erect . . . let you close in faster. To meet every requirement of industrial and commercial use . . . you can choose from a wide range of beautiful colors and textures to produce handsome exteriors at a lower building cost than usually demanded by other types of quality construction.

Write . . . now . . . for complete details on MARIETTA *solid or insulated precast wall panels.*

An Invitation . . . Investigate plant site availabilities in the fast growing Marietta industrial area . . . every possible advantage . . . our assistance . . . yours for the asking.

THE Marietta CONCRETE CORPORATION, Marietta, Ohio

Representatives in principal cities.

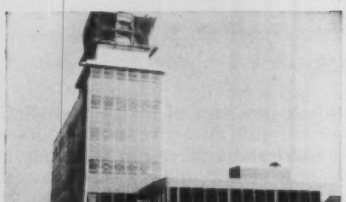
BRANCH OFFICES: 501 Fifth Ave., New York 17, N. Y., Race Rd. at Philadelphia Hwy., Baltimore 21, Md., Box 5192, Charlotte 6, N. C., 411 Fannin St., Nashville, Tenn., Box 592, Jamestown, N. Y., Hollywood, Fla.

MODERN STRUCTURES

Lamson

HIGH-STRENGTH STRUCTURAL STEEL BOLTS

400 tons of structural steel completely assembled with approximately 82,000 High-Strength Bolts—Diameters ⅝" thru 1".



And here's the result . . . a modern, safe structure, assembled quickly, less expensively and QUIETLY.

● Lamson High-Strength Bolts are the answer to today's need for construction speed and economy as well as tomorrow's requirements for strength and safety.

Once properly installed, High-Strength Bolts CANNOT be matched for strength or low inspection and maintenance costs.

Compared to old-fashioned riveting, High-Strength Bolts are stronger statically, higher in fatigue resistance and have far greater shear strength.

In the photographs to the left you see the new airport terminal at Cleveland's Hopkins airport . . . completely assembled with Lamson High-Strength Structural Steel Bolts . . . another safe, modern structure . . . designed for tomorrow—today.

Write for the COMPLETE High-Strength Bolt story. This 8-page brochure is yours for the asking without obligation.

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Birmingham • Chicago

Large Bolts • Cotters

Square and Hex Nuts • Weather-tight Bolts • Bent Bolts

Phillips and Clutch Head Screws • Lock Nuts • Cap Screws

(Continued from page 116)

North Saskatchewan River, $1,500,000. Gore & Storrie Ltd., 1130 Bay St., Toronto, Ont., engrs.

BIDS ASKED—BUILDINGS

▲ **Ont., Brockville**—PLANT—BA 4/25—Parke Davis & Co., Ltd., 2301 Sandwich St. E., Windsor, 144,000 sq. ft., pharmaceutical plant, $1,000,000. Giffels & Vallet of Canada Ltd., Canada Trust Bldg., Windsor, engrs. CD 10/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **General Constr. Co. Ltd.**, Granville Island, Vancouver, B. C., CA $929,625, railway, Mile 20 to Mile 38, Prince George to Dawson Creek, CD 3/25, under LB.

Emil Anderson Constr. Co. Ltd., Hope, B. C., CA $544,035, 19 mile section of roadbed for railway exten. from Mile 38 to Mile 57, north of Prince George, BRITISH COLUMBIA. Pacific Great Eastern Ry. Co., W. A. C. Benett, pres., 736 Granville St., Vancouver, B. C., Bids Mar. 24, awarded Mar. 31, CD 3/30, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Dawson & Hall, Ltd.**, 775 Clark Dr., Vancouver, B. C., CA, $2,484,326, CORRECTIONAL INSTITUTE, HANEY, B. C. B. C. Govt., Douglas Bldg., Victoria, B. C. Bids Mar. 24. CD 3/29, under LB.

Barnabe et Fils Ltee, 1205 Second Ave., Quebec City, Que., CA, $500,000, rein.-con. CONVENT, St. Louis of France St., LAUZON, QUE. Sisters of Charity of St. Louis of France, Lauzon, Que. Awarded Apr. 2. CD 2/18.

B. G. L. Engineers & Builders Ltd., 7020 Cote des Neiges Rd., Montreal, Que., LB $578,300. SCHOOL, Terrebonne Ave. between Cavendish and Benny Aves., MONTREAL, QUE. Montreal Catholic Comn., 117 Ste Catherine St. W., Montreal, Que. Bids Mar. 31.

▲ **Shell Constr. Co.**, 15130 Gouin Blvd., Montreal, Que. Owner Builds. $8,500,000. 800 low cost HOUSES, sewers and water mains, MONTREAL, QUE. Arnold Schrier, 4147 Sherbrooke St. W, Montreal, Que., archt.

Cote et Lafleur, 47 Ste. Marguerite St., Quebec City, Que., CA, $700,000, 13 APARTMENT BLOCKS various sizes on various streets, QUEBEC CITY, QUE. M. Darabaner, 213 East Charest Blvd., Quebec City, Que. Awarded Mar. 31.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Raber & Kief**, 402 Queen Anne Ave., Seattle, Wash. LB $1,168,975. water and fire alarm sys., KODIAK, ALASKA. P. Wks. Office, 17th Naval Dist., Kodiak, Alaska. CD 9/17.

Proposed Projects

WATER SUPPLY

▲ **Calif., Beverly Hills**—City, City Hall, voted $2,200,000 bonds, 2 water reservoirs, major pipe lines, pumping plants. James M. Montgomery, 15 N. Oakland Ave., Pasadena, consult. engr. CD 2/14.

▲ **Calif., La Mesa**—La Mesa, Lemon Grove & Spring Valley Irrigation District, 4769 Spring St., La Mesa pipe system, incl. 59,700 ft. 7 in. asbestos cement pipe, 95,300 ft. 8 in. asbestos cement and/or c.i. pipe, 19,900 ft. 10 in. asbestos cement and/or c.i. pipe, 89,700 ft. 12 in. c.i. pipe, 2,800 ft. 16 in. c.i. pipe, one 2 m.g. 24x120 ft. steel tank, one 2 m.g. 32x105 ft. steel tank, one 1 m.g. 35x70 ft. steel tank, 2 pumping plants using submersible pumps. $2,000,000. Byrl D. Phelps, Civic Center, San Diego, engr. H. H. Wilken, is project engr. M. J. Shelton, c/o owner, genl. mgr. and ch. engr. CD 11/8/48.

Okla., Midwest City—City, voted bonds Mar. 29, 8 wells and water main exten. $852,000. Rex Collins McAlester, consult. engr. CD 3/8.

▲ **Tex., Midland**—City, voted bonds Apr. 5, WW sys. rehabilitation, $75,000; addnl. water supplies, facilities at McMillen Field, $375,000; water distr. lines, $615,000; water storage, $85,000; water supply, $100,000. CD 3/24.

Wyo., Rawlins—City, imprv. water and sewerage systems. $900,000.

SEWERS, WASTE DISPOSAL

▲ **Calif., Los Angeles**—City, City Hall, voted $60,000,000 bonds Apr. 5, sewers.

Ind., Mount Vernon—Bd. P. Wks., City Hall, sewage treatment plant and sewers. $710,000. Paul J. Kleiser & Assocs., Tippecanoe St., Terre Haute, consult. engrs. CD 11/26/43.

Mo., Harrisonville—City, sewage disposal plant, $500,000. Prichard & Assoc., 206½ N. Liberty St., Independance, engrs. CD 8/28/53.

▲ **N. Y., Tonawanda**—Town of Tonawanda Sewer Dist. No. 2, Municipal Bldg., Kenmore, sanitary sewerage sys. imprvs., added pumping facilities, increase capacity sewage plant, addnl. sewer mains. $1,500,000. Nussbaumer, Clarke & Velzy, Inc., 327 Franklin St., Buffalo, consult. engr. Alfred R. Krehbiel, c/o owner, engr. CD 3/25/46.

(Continued on page 123)

Years of service. Long, trouble-free life is assured by K&M Corrugated Asbestos Sheets. They are used on the roof and sides of this building at the Osgood Company, Marion, Ohio. Application Contractor: Elwin G. Smith Co., Toledo, Ohio.

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with K&M Corrugated Asbestos Roofing and Siding

When K&M Corrugated Asbestos Sheets go up, upkeep expenses stay down. They never need protective painting, require little or no maintenance.

Really rugged. These sheets are strong, dense, and tough. Made of asbestos fiber and portland cement, they won't burn, rot, or corrode. And they're highly resistant to extremes in weather.

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"ALL STEEL"

The Structural Steel framework during erection. The tied rigid frames were erected in three pieces, each frame requiring but two hours to set in place. The frames, structural members, and balcony deck totaled 201 tons.

The Field House in the final stages of construction. Steel roof and sidewall Z panels were shop assembled in sections measuring 6' x 18'. Each section required only 10 minutes to set in place. The Z panels were made of 16 gage black sheets, and totaled 101 tons.

FIELD HOUSE
erected at Allegheny College

THE NEW FIELD HOUSE at Allegheny College, Meadville, Pa., is virtually an "all steel" structure, since the rigid frames . . . the roof . . . sidewalls . . . entry ways . . . windows . . . all the trim . . . and even the balcony deck are of steel.

Installations such as this illustrate the amazing versatility of steel — the versatility that permits steel to do *so many jobs so well.* And they illustrate, too, the strength and safety offered by Structural Steel. It's common knowledge that Structural Steel is the strongest of load-carrying materials. It will withstand more abuse than other structural materials, effectively resisting tension, torsion, compression and shear. Yet, Structural Steel is the most economical of load-carrying materials. Enclosed in buildings, it will last indefinitely—requiring no maintenance. Equally adaptable to riveting, welding or bolting, it can be erected in any weather in which men can work. Moreover, since Steel members are fabricated indoors, weather can have no effect on the quality of workmanship.

* * *

Structural Steel and panel designs, plus fabrication and erection were by the Pittsburgh-Des Moines Steel Company, Pittsburgh 25, Pa. The architect was Lorimer Rich and Associates, New York 9, N. Y. Consulting Engineers to the Architect were Severud-Elstad-Krueger, New York, N. Y. General Contractor was Crump, Incorporated, Pittsburgh, Pennsylvania.

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USS STRUCTURAL STEEL

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UNITED STATES STEEL

Interior — nearing completion. The Steel deck balcony was designed and built by the Pittsburgh-Des Moines Steel Company under its patents for Steel Deck Grandstands. Opening frames, closures, and trim — all of steel — amounted to 30 tons.

An excellent booklet on construction with steel, entitled "Hot Rolled Carbon Steel—SHAPES & PLATES" is now available. Send for your FREE copy.

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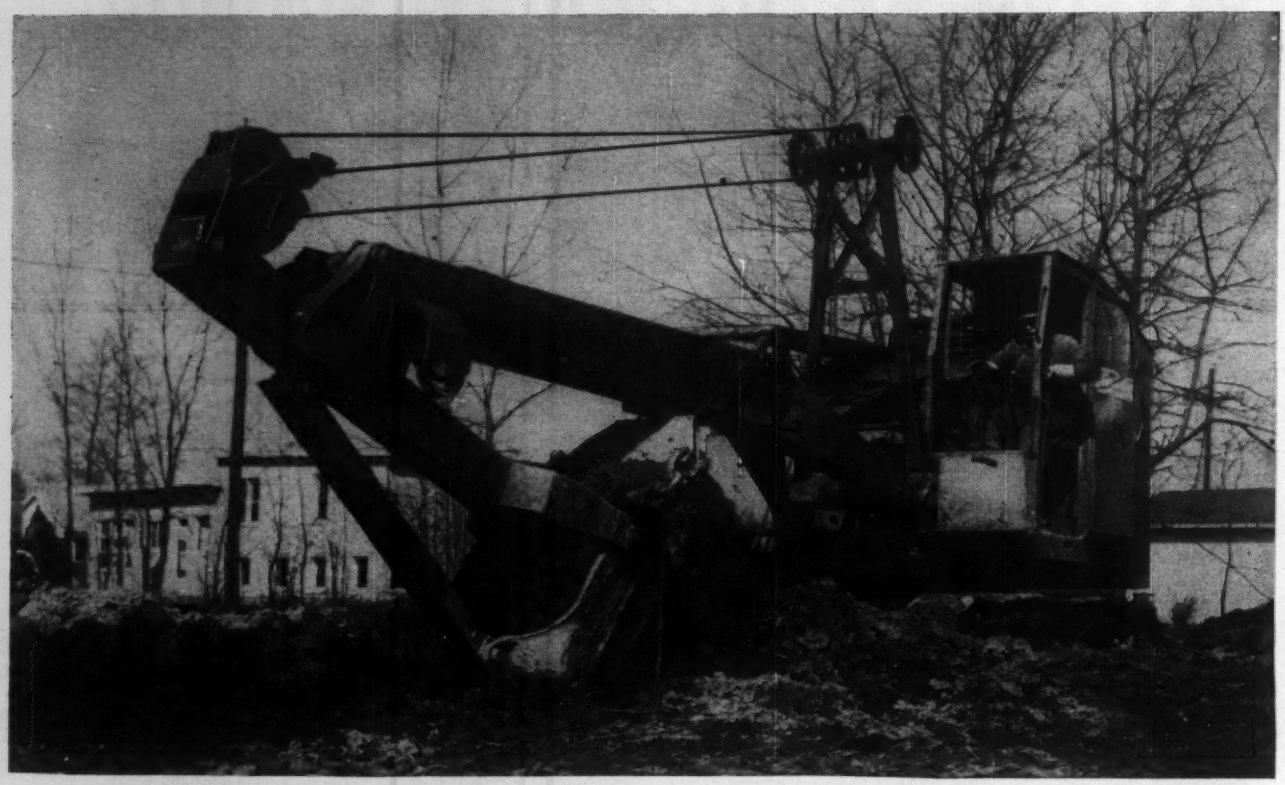

Amsco backhoe bucket at work

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concaves
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jaw plates
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bulldozer blades
tractor rollers, idlers
sprockets, grouser bars
truck beds
grizzle parts
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sheaves, gears, pinions

Amsco also produces other alloy steels with maximum wear resistance under particular conditions of service.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

(Continued from page 118)

Okla., Midwest City—City, voted bonds Mar. 29, sanitary sewers and sewage disposal plant, $687,000. Rex Collins, McAlester, consult. engr. CD 3/8.

Utah, Salt Lake City—Salt Lake Co. Comn., City-County Bldg., constr. new Salt Lake County Cottonwood Sewer District, $650,000, Neff Engineer, 2500 Evergreen Ave., consult. engr.

BRIDGES

IDAHO—State Hy. Dpt., Boise,
Bennock Co.—underpass at railroad crossing with 4-lane connections, Pocatello, $780,000.

Ia., Cedar Rapids—City, City Hall, paving. $735,000. CD 3/3/54.

▲ Mo., Platte City—Platte Co., c/o Wm. M. Anderson, presiding judge, Platte County Court, bridge near Fairfax Bridge, $3,000,000, Sverdrup & Parcel, 20 and Nash Sts., St. Louis, consult. engrs.

STREETS AND ROADS

Ga., Atlanta—City, City Hall, relocation and widening 10 St. from W. Peachtree to Peachtree St. $500,000. CD 7/23.

▲ IDAHO—State Hy. Dpt., Boise,
Bannock Co.—6 mi. 2-lane highway section of Hy. No. 30 N, Pocatello, $1,500,000.

Tex., Midland—City, voted bonds Apr. 5, street paving. $825,000. CD 3/24.

EARTHWORK, WATERWAYS

▲ Ont., Sault Ste. Marie—POWER DEVELOPMENT Great Lakes Power Co., Sault Ste. Marie, hydro-electric power development, incl. raising company's Montreal River dam 33 ft. $4,000,000. E. F. Hollingsworth, c/o owner, engr. CD 5/4/48, under Industrial Buildings.

AIRPORTS

▲† Mo., Sedalia—HOUSING—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., plans by Tanner-Mitchell, engrs.-archts., 6244 Troost St., Kansas City, Mo., housing units at Sedalia Air Force Base. $5,000,000. CD 8/30.

▲† Tex., San Marcos—HOUSING—U. S. Air Force Base, Gary Air Force Base, San Marcos, plans by O'Neal Ford, 228 E. Martin St., San Antonio, 100-unit housing proj., 60-acre site. $1,250,000. CD 2/15/51.

LATIN AMERICA

▲ Mexico, Reynosa—FACTORY—Sria de Agricultura D. F. (Guano y Fertilizantes), plans farm fertilizers factory. $28,000,000.

PUBLIC BUILDINGS

▲ Calif., Los Angeles—SCHOOLS, etc.—Bd. Educ., 1425 S. San Pedro St., voted $133,000,000 bonds for elementary schools, Junior College and high schools. CD 1/5.

▲ Calif., Los Angeles—DORMITORY, etc.—University of California, 405 Hilgard St., plans by Welton Becket & Assocs., 8657 Wilshire Blvd., Los Angeles, 680-man dormitory, $1,000,000; 2 auto parking structures, $300,000.

▲ Colo., Grand Junction — HOME and TRAINING SCHOOL—State of Colorado, Dpt. P. Instructions, State Capitol Bldg., Denver, State Home and Training School expansion. $1,250,000.

▲ Conn., Hartford—STATE OFFICE—State, P. Wks. Comr., State Office Bldg., plans by Douglas Orr, 111 Whitney Ave., New Haven, legislative appropriation asked state office bldg., Capitol Ave. $6,000,000. CD 10/27/53.

▲† D. C., Wash.—SCIENCE, PHYSICAL EDUCATION, etc.—General Services Admin., P. Bldgs. Service, General Services Bldg., military science-physical education bldg., $4,900,000; home economics bldg., $1,000,000; plans by Rovbinson & Williams, 1927 11 St. N.W. Wash. D. C., men's dormitory at Howard University, $1,300,000.

▲ Ill., Rushville—SCHOOL—Schuyler Co., Rushville, defeated $1,131,000 bonds, high school.

Ill., Springfield—SCHOOLS—School District No. 5, Sangamon Co., Springfield, voted $650,000 bonds remodeling and addns. to 2 high schools.

Ind., Indianapolis—SCHOOL—Bd. School Comrs., M. V. Bailey, bus. dir., 150 N. Meridian St., Zone 4, plans by Lennox & Matthew, 644 E. 38 St., Zone 5, 2 story, brick elementary school, E. 16 St. and Graham Ave. $535,000. CD 10/29/53.

▲ La., Marksville—SCHOOL—Avoyelles Parish School Bd., Marksville, school for new Consolidated District No. 1. $1,750,000. (Correction-status). CD 2/8.

Md., Towson—SCHOOL—Bd. Educ., Baltimore Co., Aigburth Rd., plans by Tyler, Ketcham & Myers, 513 Park Ave., Baltimore, Zone 1, masonry Middlesex Elementary School, Middlesex Housing Development. $600,000.

Mass., Weymouth—SCHOOL—Town, Elmer S. Mapes, supt. Schools, 89 Middle St., Washington School, East Weymouth Playground, East Weymouth. $500,000.

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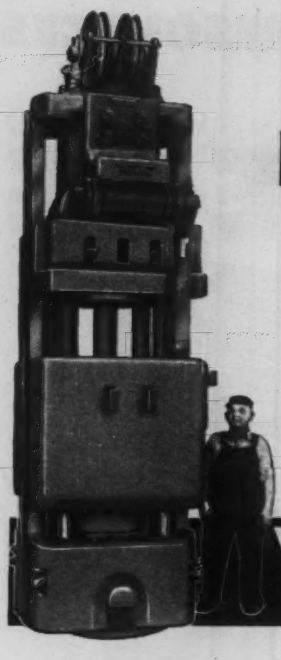

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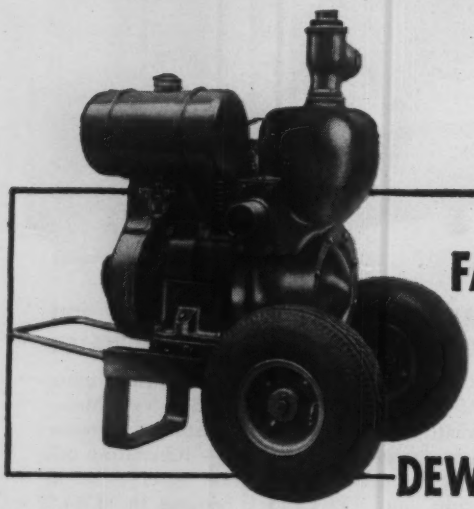

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▲ **Mich., Alpena**—HOSPITAL—Bd. Trustees, Alpena Hospital, Alpena, plans by Schmidt, Garden & Erikson, 104 S. Michigan St., Chicago, Ill., 3 story hospital wing addn., $1,095,000. CD 12/14/54, under Commercial Buildings.

▲ **Mich., Plymouth**—SCHOOLS—City Bd. Educ., Plymouth, elementary school, $600,000; elementary school, $400,000; Junior High School, $1,200,000.

Neb., Omaha—SCHOOL—Bd. Educ., 3902 Davenport St., plans by Steele, Sandham & Steele, Electric Bldg., Belvedere School addn., 38 and Curtis Ave. $500,000. CD 5/21.

▲ **N. Y., Brooklyn**—HOUSING—New York City Housing Auth., 299 Broadway, New York, Zone 7, plans by Keally & Patterson, 17 E. 49 St., New York, Zone 17, Bushwick Houses for 1,200-families, Varet and Morrell Sts. $15,000,000. CD 3/16/ 54.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Chapman, Evans & Delehanty, 50 Broadway, Zone 4, Mill Brook Houses, Proj. for 1,255-families, St. Ann's Ave. and E. 137 St. $10,000,000. CD 10/16/53.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Katz, Waisman, Blumenkranz, Schreiber, Stein, Weber, Architects Associated, 551 Fifth Ave., Zone 17, Castle Hill Houses for 1,500 families, Randall Ave. and Castle Hill Ave. $19,000,000. CD 3/12/54.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Kahn & Jacobs, 2 Park Ave., Zone 16, Frederick Douglass Houses for 2,000-families, W. 102 St. and Columbus Ave. $30,000,000. CD 3/11/52.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by William Lescaze, 211 E. 48 St., Zone 17, Manhattanville Houses for 1,275 families, W. 130 St. and Broadway. $15,000,000. CD 1/5/45.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 299 Broadway, Zone 7, plans by Voorhees, Walker, Smith & Smith, 101 Park Ave., Zone 17, St. Mary's Park Houses for 1,008 families, E. 149 St. and Cauldwell Ave. $10,000,000.

▲ **N. Y., New York**—HOUSES—New York City Housing Auth., 299 Broadway, Zone 7, plans by Holden, Egan & Assoc., 215 E. 37 St., Zone 16, Franklin Houses for 1,400 families, E. 108 St. and Second Ave. $14,000,000. CD 3/10/54.

▲ **N. Y., New York**—HOUSES—New York City Housing Auth., 299 Broadway, Zone 7, plans by DeYoung & Moscowitz, 205 E. 42 St., Zone 17, Senator Robert A. Taft Houses for 1,440 families, 112 St. and Park Ave. $14,000,000. CD 6/17/43.

▲ **Pa., Perryopolis**—SCHOOL—School Dist. of Perry Twp. and Lower Tyrone, State School Auth., Harrisburg, plans by Altman & Altman, 206 Derrick Ave., Uniontown, 2 story, bsmnt. Junior-Senior High School, $1,179,031. CD 12/29/52.

▲ **Tenn., Nashville**—HOSPITAL BLDG—State of Tennessee, State Capitol, plans by Taylor & Crabtree, 1805 Hayes St., 5 story, brick, steel, aluminum structure receiving and treatment center at Central State Mental Hospital. $2,000,000. CD 5/13/49.

▲ **Tex., Alvin**—SCHOOL—Alvin Independent School Dist., Alvin, voted bonds, school $600,000; physical education and indoor swimming pool and school repairs, $400,000. CD 3/21.

Tex., Humble—SCHOOL—Humble Independent School District, Humble, bond election May 7, school $600,000. CD 3/17.

▲ **Tex., San Antonio**—SCHOOLS—Edgewood Independent School Dist., 525 Cupples St., bond election May 7, Junior-Senior High School unit, $700,000; Elementary School No. 1, $450,000; Elementary School No. 2, $350,000. CD 9/1.

▲ **Tex., San Antonio**—SCHOOLS—Northeast Independent School Dist., c/o C. L. Camp, Lockwood-Selma Rds., bond election of Apr. 16 cancelled, Senior High School, $1,000,000; Elementary School No. 1 (Allena Village), $375,000; Elementary School No. 2 (Dellview), $365,000; Elementary School No. 3 (Dellwood), $350,000; Elementary School No. 4 (Castle Hills), $370,000; Elementary School No. 5 (Hollywood Estates), $380,000; Junior High School, $910,000. CD 3/23.

Utah, Ogden—VOCATIONAL EDUCATION—State Bldg. Bd., 419 State Capitol, Salt Lake City, vocational education bldg. and gymnasium at new Weber College Campus. $525,000 loan approved.

▲ **Wash., Longview**—SCHOOL—School District No. 122, Longview, plans by McGuire & Muri, 231 Broadway, Tacoma, Junior-High School. $1,440,000. CD 11/9.

Wash., Wapato—SCHOOL—School Bd., Wapato, high school. $750,000.

Ont., Galt—SCHOOL—Bd. Educ., 13 Water St. N., plans by Page & Steele, 72 St. Clair Ave. W., Toronto, high school. $900,000. CD 3/15.

▲ **Ont., Willowdale**—SCHOOL—North York Bd. Educ., 7 Kenneth St., plans by Irving Boigen, 321 Davenport Rd. and Pentland & Baker, 490 Jarvis St., both Toronto, 2 story school, Bathurst and Finch Aves. $1,300,000. Wallace, Carruthers & Assocs., 35 Isabella St., Toronto, consult. engrs.

▲ **Sask., Moose Jaw**—POST OFFICE—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by E. A. Gardner, c/o owner, ch. archt. post office on site of present city hall, $2,000,000.

COMMERCIAL BUILDINGS

▲ **Ariz., Tucson**—SEMINARY—Roman Catholic Church, Tucson Diocese, Tucson, plans by Terry Atkinson, 33 W. Alameda St., seminary, E. 22 St. and Spanish Trail Rd. $1,200,000.

▲ **Calif., Covina**—DWELLINGS—Pelton Zahler Constr. Co., 373 S. Robertson, Beverly Hills, plans by Reichl

(Continued on page 126)

(*Advertisement*)

HIGH SPEED CONCRETE FORMING

Form and Pour 75 ft. diameter tank 26 ft. high in 8 hours!

9:30 am POURING started at 8:00 am. Here is 6 ft of concrete in place.

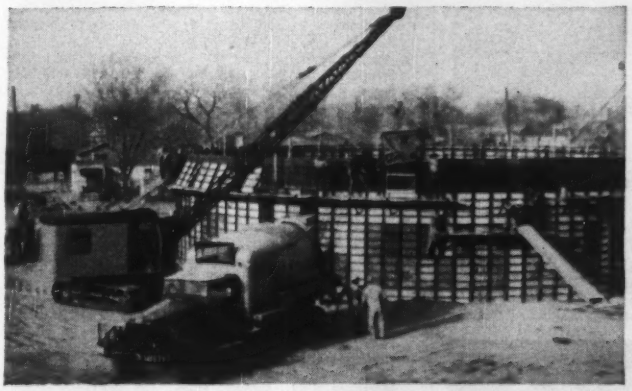
How a contractor formed and poured a circular tank 75 ft. in diameter with walls 26 ft. high and 14 inches thick in 8 hours, with maximum economy makes the concrete forming speed story of the year.

The tank was formed and poured by the contractor, C. H. Leavell & Co., El Paso, Texas, in record time, and a tough

11:30 am FORMING AND POURING were in full production at the 10-ft level.

forming specification limiting maximum free drop of concrete to 4 ft. was rigidly adhered to.

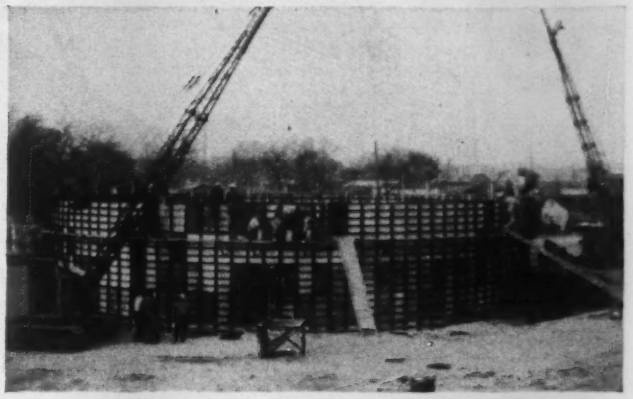
UNI-FORM Concrete Forms — the prefabricated, ready to use form panels — were used on the job. Because UNI-FORMS



4:00 pm POURING at 22-ft level. Scaffold setters on final placement.

erect into a tight, rigid, automatically accurate form requiring alignment and bracing on 1 side only, the contractor conceived the idea of simultaneously forming and pouring the wall. Universal Form Clamp Co. engineers on the job agreed that the plan was feasible.

Rigidity of the steel-framed, plywood faced UNI-FORMS permitted fast, non-stop erection of the entire inside form. This permitted setting of reinforcing steel, outside forming, and concrete placement to proceed with maximum efficiency, speed and safety. The outside of the tank was formed using 5 lifts of 4 ft. and 2 lifts of 3 ft. UNI-FORM Panels. In this way, the concrete never dropped more than the specified 4 ft. below the height of the outside form.



4:45 pm UNI-FORMS now completed.

5:15 pm Final concrete poured.

As successive pours were completed, the outside form was closed by setting the UNI-FORM Panels in place and locking them to the projecting UNI-FORM Ties. UNI-FORM Circular Wall Fillers, which member with UNI-FORM Panels, permitted forming the curve of the wall to specifications. Automatically accurate wall widths were insured, as the UNI-FORM Ties spread and locked the face of the Panels exactly 14" apart. UNI-FORM Scaffold Brackets, which fasten directly to the steel UNI-FORM frame, provided fast, low cost scaffolding.

The result? Under the capable direction of job superintendent Paul Nigh and project manager N. J. Riebe — fast, low cost forming and pouring — an accurate, smooth faced wall with true curvature.

UNI-FORM Panels are versatile, high speed forming tools. They're used by the country's most successful contractors to form every conceivable type of construction. They are rented or sold . . . or rented with purchase option. Universal Distributors and Branches are located from Coast-to-coast. Write for UNI-FORM Catalog and complete details on UNI-FORMING — the *modern* way to form concrete.

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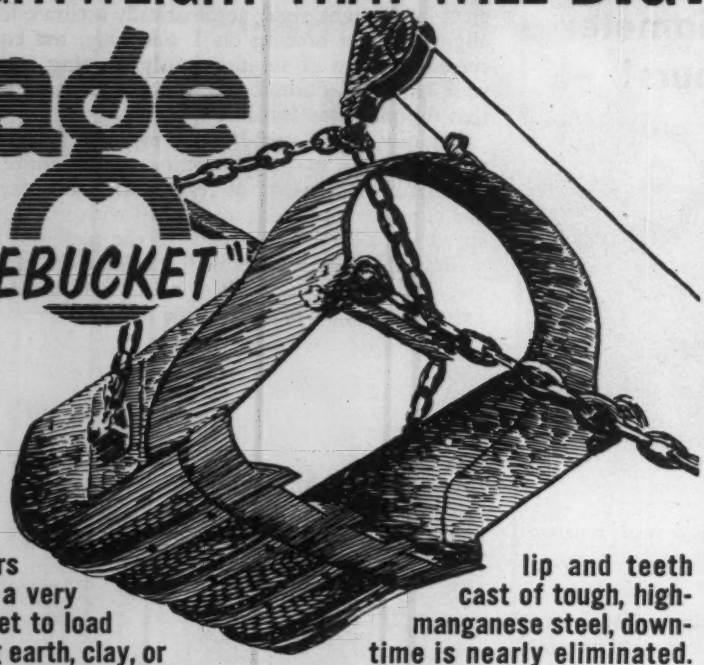

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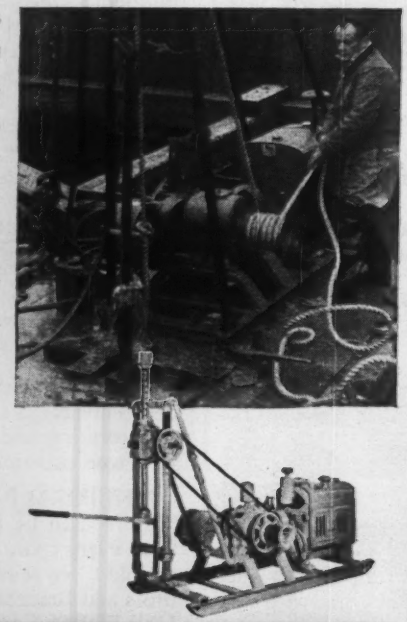

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(Continued from page 124)

& Starkman, 1032 S. La Cienega Blvd., Los Angeles, 137 frame, stucco dwellings, $1,250,000.

Calif, Hemet—DWELLINGS—Bayre Constr. Co., c/o Reichl & Starkman, archts., 1022 S. La Cienega Blvd., Los Angeles, 86 frame, stucco dwellings, $850,000.

Calif., Fullerton—DWELLINGS—Crown Constr. Co., 1231 S. La Brea Ave., Los Angeles, plans by Wm. M. Bray, 962 N. La Cienega Blvd., Los Angeles, 70 frame, stucco dwellings, $700,000.

▲ Calif., La Habra—DWELLINGS—D. & E. Corp., 8906 W. Olympic Blvd., Beverly Hills, plans by Reichl & Starkman, 1022 S. La Cienega Blvd., Los Angeles, 222 frame, stucco dwellings, $2,000,000.

Calif., Northridge—DWELLINGS—Consolidated Builders, 8900 W. Olympic St., Beverly Hills, plans by D. L. Dworsky, 451 S. Robertson Blvd., Beverly Hills, 75 frame, stucco dwellings, in Northridge area, $750,000.

▲ Md., Bethesda—OFFICE—Government Employees Insurance Co., 14 and L Sts. N.W., Wash. D. C., plans by A. R. Clas, Wyatt Bldg., Wash. D. C., 3 story office, Western and Wisconsin Aves., $3,500,000.

▲ Md., Landover—SHOPPING CENTER—Frank Development Corp., 1523 L St. N. W., Wash., D. C., regional shopping center, George Palmer Hy. and Sheriff Rd. $20,000,000. CD 3/10/54, under Md., Upper Marlboro.

▲ N. Y., Buffalo—OFFICE—General Medical Bldg., Inc., Wh. L. Marcy, pres., Erie County Bank Bldg., plans by Backus, Crane & Love, 232 Delaware Ave., 8 story 50x160 ft. steel, brick bldg. for doctors offices, 2-level parking lot, Ellicott and High Sts. $2,500,000.

N. Y., New York—APARTMENT—Gracie Manor, Inc., 2416 Bridge Plaza South, Long Island City, plans by Greenberg & Ames, 303 Fourth Ave., zone 10, apartment, 508-16 E. 85 St. $675,000.

▲ N. Y., New York—APARTMENT—Rockvale Realties, Inc., 521 Fifth Ave., Zone 17, plans by Sylvan Blen, 33 W. 46 St., Zone 19, apartment, 333-39 E. 79 St. $1,200,000.

N. Y., New York—HOSPITAL WING—St. Claire's Hospital, 415 W. 51 St., Zone 19, plans by John Schlick, 8 Bridge St., Zone 4, 6 story out-patient wing to hospital, 9th Ave. and 52 St. $750,000.

▲ N. Y., New York—OFFICE—Samuel Friedenberg & Son, 161 William St., New York, Zone 7, plans by Sylvan & Robert L. Blen, 33 W. 46 St., New York, Zone 19, 25 story office, 120 Williams St. and 79 John St. $2,000,000.

▲ N. Y., New York—APARTMENT—Kenton Associates Ltd., 270 Park Ave., New York, Zone 17, plans by Hippolyte Kamenka, 101 Park Ave., New York, Zone 17, 18 story apartment, 235-43 East 57 St. $1,000,000.

N. Y., Yonkers—PROFESSIONAL—Municipal Land & Development Corp., c/o Sullivan Realty Organization, 304 North Ave., New Rochelle, professional bldg., Central Park Ave. and E. Fort Hill Rd. $700,000.

O., Athens—CHURCH—First Methodist Church, Dr. Donald R. Clippinger, chn. Bldg. Comm., Athens, church, $650,000.

O., Cincinnati—CHURCH—Christ the King Church, 3223 Linwood Rd., plans by Ed. J. Schulte, 207 Paramount Theatre Bldg., McMillan St., 1 story bsmnt., brick, stone church. $500,000. Bodenstein & Schuster, 9th and Main Sts., consult. engrs.

▲ O., Defiance—HOUSING—John W. Powiel, Defiance, 120 homes along Auglaize River Bluff, at south edge of city, on 65 acre tract, $1,000,000.

O., Strongsville—HOTEL—Strong-Terrace Hotel Corp., 3104 W. 25 St., Cleveland, Zone 13, plans by Anthony Zappa, 3922 E. 183 St., 2 story, 70-room, 138x242 ft. masonry hotel, Pearl and Fetzer Rds., incl. swimming pool. $600,000.

▲ O., Warrensville Heights—HOSPITAL—Dr. Joseph Tomarkin, Dr. M. E. Brickman, c/o Dalton-Dalton Assocs., archts., Old Arcade, Cleveland, Zone 14, 4 story, masonry hospital, 17-acre site, Warrensville Center Rd. near Harvard Rd. $1,000,000.

▲ Okla., Oklahoma City—HOSPITAL—Oklahoma State Baptist Convention, c/o Judge W. R. Wallace, chn., c/o Coston, Frankfurt & Short, engrs.-archts., 323 Madison St., 500-bed Shepherd Memorial Baptist Hospital. $2,000,000.

▲ Pa., Valley Forge—OFFICE, etc.—Albert D. Montieth, Strafford office bldg. and shopping center. $1,000,000.

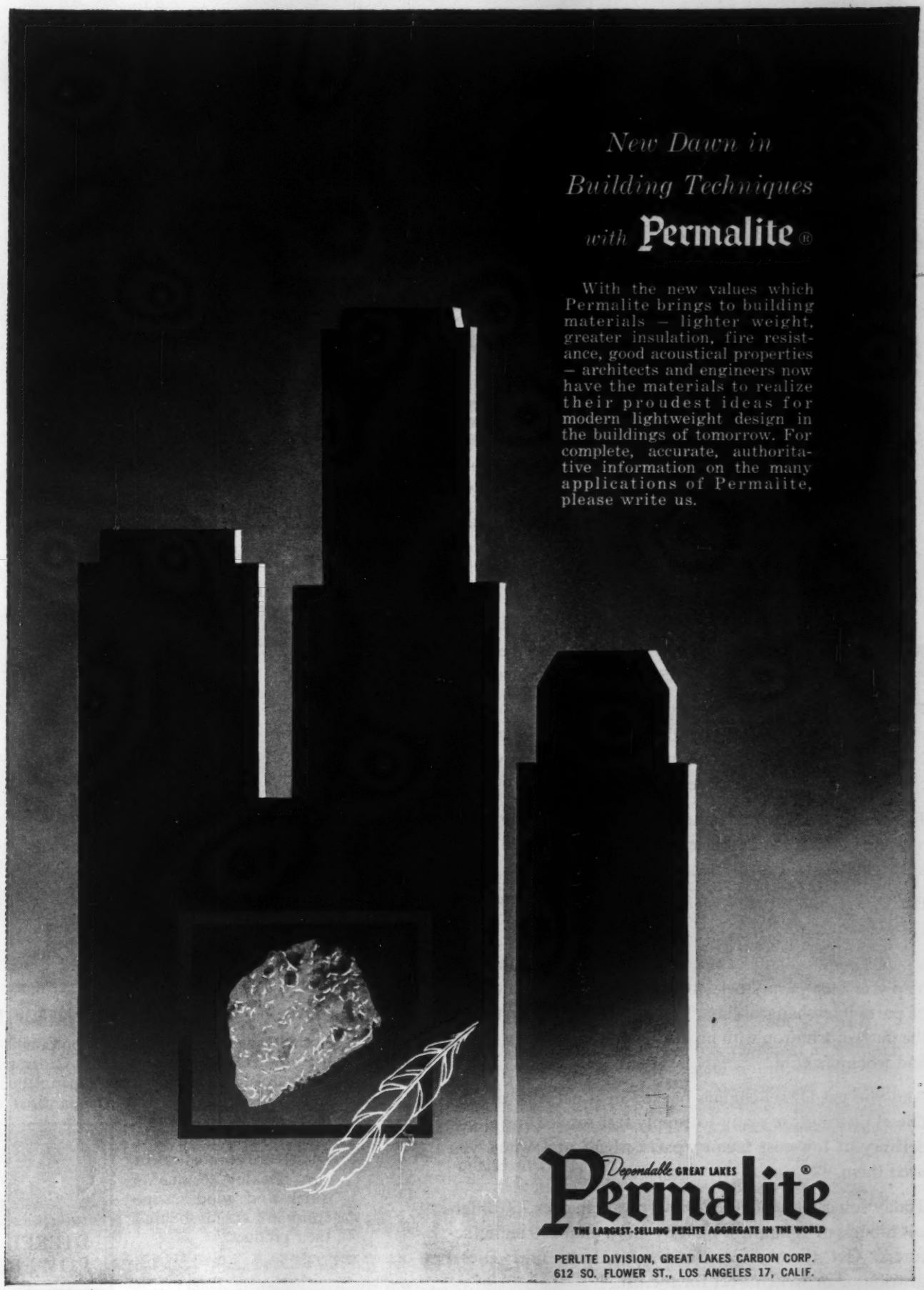
▲ Tex., Garland—DWELLINGS—Laverne, Goodwin, Garland, and H. Glenn Butler, 5941 Goodland Ave., Dallas, (A) 30 brick dwellings, $375,000, (B) 40 brick dwellings, $395,000 (C) 36 brick dwellings, $381,000 (D) 33 brick dwellings, $369,750 (E) 45 brick dwellings, $510,000 (F) 25 brick dwellings, $346,150 (G) 28 brick dwellings, $365,000 (H) 34 brick dwellings, $389,400, off North Star and Amundsen Rds.

▲ Tex., Houston—OFFICE—First Mortgage Co. of Houston, Inc., c/o T. A. Robinson, Jr., 510 Taft St., plans by Werlin-Kiefner Co., 3501 Buffalo Dr., 5 story, masonry office to be known as "Buffalo-Stanford" Bldg., fdn. for 3 addnl. floors, Buffalo Dr. and Stamford St. $1,500,000.

Tex., Houston—OFFICE—K. E. Womack, Jr., Cotton Exchange Bldg., plans by Cameron Fairchild & Assocs., 2626 Westheimer Rd., 7 story office to be called "Barristers" Bldg. $500,000. Walter P. Moore, 2 Pinedale St., and Reginald F. Taylor, 910 Bankers Mortgage Bldg., consult. engrs. CD 3/21.

▲ Va., Arlington—SCHOOL—Catholic Diocese of Richmond, Va., 807 Cathedral Ave., Richmond, Dennis

(Continued on page 131)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Iowa's Gene McClain Construction Company has GM Diesel power in this Cedarapids asphalt plant and in a shovel. Superintendent Jim Grundy says, "We've standardized on GM Diesel power for this operation because GM Diesels are economical to run. Dealer service is quick and good . . . the company stands behind their product."

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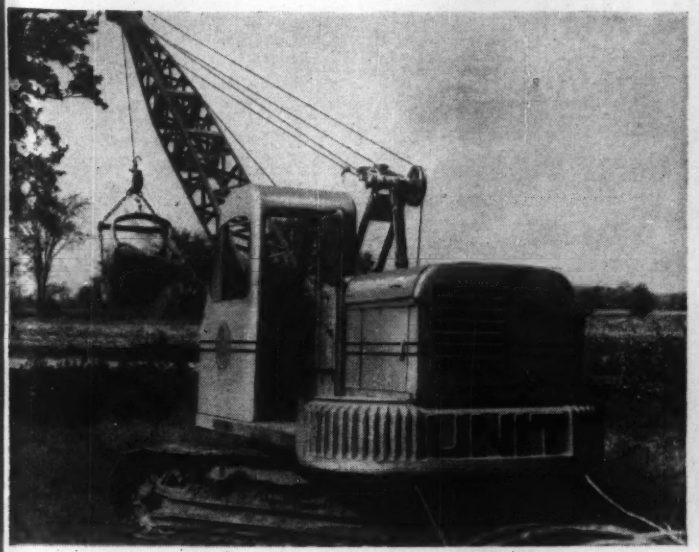

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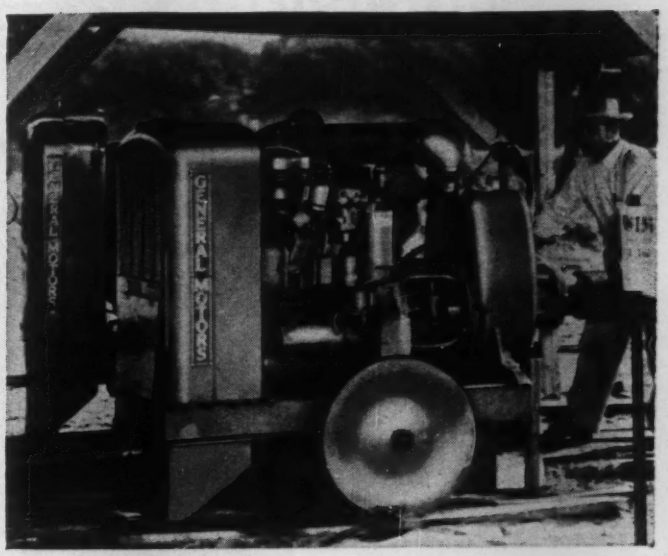
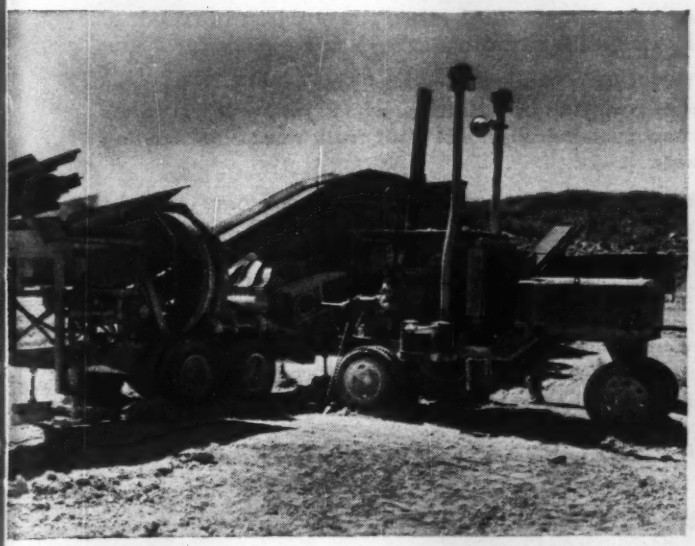


MULTIMILLION-DOLLAR DEPENDABILITY

Faced with wet footings on this multimillion-dollar sewage plant contract, Pittsburgh's Rust Engineering Company put GM Diesel-powered Jaeger dewatering pumps to work. Superintendent P. J. Pedone says, "The GM Diesel engines have proved very satisfactory . . . they're keeping footings dry so we can go ahead with the job."



3 GM UNITS ALMOST DOUBLE OUTPUT

Kansas' Reno Construction Company reports their new Cedarapids portable rock crusher with three new GM Diesels stepped up output from 200 tons per hr. to almost 400 tons. One "6-110" Diesel powers the primary 36" x 45" double impeller impact breaker; a GM Twin "6-71" powers the secondary and a "3-71" powers the conveyors, screen and feeders.

25% MORE WORK FROM GM DIESEL POWER

One of the best known excavating companies in Northern New Jersey and New York State is Raymond L. Cole Construction Co. "Our GM Diesel-powered American shovels do at least 25% more work than other Diesels in the same number of hours. They are more flexible," reports this user of one 1½- and three ¾-yard shovels . . . all GM powered.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.

INTERNATIONAL Model RF-230 6-wheeler, built and powered for toughest off-highway work and fast, capacity-load over-the-road hauling. Has new 212-hp. Royal Red Diamond 501 engine, famous extra-rugged INTERNATIONAL bogie.

Built to Cut Costs All Ways

INTERNATIONAL Trucks are Tough-Job engineered—built to give extra long service, and to work with minimum maintenance and at lowest operating expense, *per mile, per load, per job.*

You get this economy, *standard*—when you buy INTERNATIONALS. But you also get a big extra that saves you big money.

INTERNATIONALS are "made to measure" for your job, with power and power conversion ratios, frames, wheels and axle capacities that will most economically meet your truck needs and hauling requirements.

With INTERNATIONALS you not only know the economy of trucks built to take it. You know the economy of trucks specifically suited to your operation.

INTERNATIONAL has led the heavy-duty field for 23 straight years through this method of building and selling trucks. It will pay off for you in lowered hauling costs, as it has for thousands of truck operators. See your nearby INTERNATIONAL Dealer or Branch and get full facts.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

AMERICA'S MOST COMPLETE TRUCK LINE

200 basic models from ½-ton pickups to 90,000 lbs. GVW off-highway models, including six-wheel, four-wheel drive, cab-over-engine, cab-forward and multi-stop delivery types . . . 32 engines from 108 to 356 hp., with widest choice of gasoline, LPG, or diesel power . . . wheelbases, transmissions and axle ratios for every need . . . thousands of variations for exact job specialization.

International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors...Motor Trucks...Industrial Power...Refrigerators and Freezers

Watch "The Halls of Ivy," with Ronald Colman and Benita Hume, CBS-TV, Tuesdays, 8:30 p.m., EST

INTERNATIONAL® TRUCKS

"Standard of the Highway"

(Continued from page 126)

J. O'Connell High School, N. 26 and Underwood Sts. $2,500,000.

▲† Va., Fort Eustis—HOUSING—U. S. Eng., foot of Front St., Norfolk, plans by E. Tucker Carlton, 206 E. Cary St., Richmond, construct, manage, finance housing proj. $3,000,000.

Va., Hopewell — HOSPITAL — John Randolph Hospital, Hopewell, hospital addn. $756,225.

W. Va., Charleston—DOCTORS OFFICE—Doctors Building, Inc., Kanawha Bank & Trust Bldg. plans by Martens & Son, 1503 Virginia St., 7 story, 72x80 ft., brick, masonry doctors office bldg., Brooks and Quarrier Sts. $750,000 or more. CD 7/6.

▲ Wis., Wauwatosa—HOTEL—J. L. Callan & R. Ryan, 4417 W. North Ave., Milwaukee, plans by A. W. Gross, 4179 N. 15 St., Milwaukee, hotel, $2,500,000

▲ Ont., Cornwall—APARTMENT—Cumberland Holdings Ltd., Cornwall, first stage apartment, Third and Cumberland Sts. $500,000; second stage, apartment, Third St., $750,000.

▲ Ont., Ottawa—HOUSING—Ottawa Const. Finance Ltd., Heron Rd., Ottawa, 1137 Richard St., Ottawa, housing, Ottawa East at Brantwood Beach Playground, $1,000,000; housing, Heron Rd., $5,000,000.

INDUSTRIAL BUILDINGS

▲ Massachusetts—POWER PLANT—Yankee Atomic Electric Co., William Webster, pres., 441 Stuart St., Boston, atomic power plant, approx. 100,000 kilowatts, proposal submitted to Atomic Energy Commission for construction and operation, western part, $3,000,000.

Mich., Dearborn—PLANT—Fred V. Gentsch, Inc., Elkhart, Ind., 45,000 sq. ft. furniture mfg. plant, Telegraph between Joy and Chicago Sts. $500,000.

▲ Minn., St. Paul—PLANT—Engineering Research Assoc., Div. of Remington Rand, 2295 University Ave., electronics plant and laboratory on tract enclosed by Norfolk Ave., Seventh and Davern Sts., Mississippi River, about 200,000 sq. ft. $2,000,000.

Okla., Enid—LABORATORY, etc.—Union Equity Co-operative, Enid, plans by Thomas Rogers, Bass Bldg., laboratory and office bldg. $500,000. CD 9/6/51.

Pa., Kobuta—LABORATORY—Kopper's Co., Inc., Koppers Bldg., Pittsburgh, 2 story, bsmnt., 50x78 ft., 1 story, 74x114 ft. brick, block, steel development laboratories, $500,000. CD 3/19/51.

Pa., Phila.—MANUFACTURING—Kuss Machine Tool & Die Co., Inc., 2214 N. 27 St., mfg. bldg. $600,000.

Pa., Pittsburgh—BUS TERMINAL—Pennsylvania Greyhound Lines, Liberty and Grant Sts., plans by Hoffman & Crumpton, 700 Century Bldg., 2 story, brick, block, steel bus terminal, Liberty Ave. between 11 and 12 Sts. $500,000.

Va., Lynchburg—FACTORY—Old Dominion Box Co., Inc., 22 Ninth St., plans by Wiley & Wilson, engrs.-archt., Courtland Bldg., factory, Madison Heights. $775,000. CD 12/15/52.

W. Va., Princeton—SCHOOL—Bd. Educ., Mercer Co., Princeton, Bluefield High School, Bluefield, $800,000 or more. CD 11/6/53.

▲ Ont., Kingston—PLANT—Canadian Industries Ltd., 1253 McGill College, Montreal, Que., ammonia plant $8,000,000-$9,000,000.

▲ Ont., Kirkland Lake — PLANT — Jones & Laughlin Steel Corp., 401 Liberty Ave., Pittsburgh, Pa., U.S.A., concentrating plant for primary treatment of iron ore on Boston Creek, Boston Twp. 6 mi. south of here, $10,000,000.

▲ Ont., Sioux Lookout—MILL—Anglo-Newfoundland Development Co. Ltd., Grand Falls, Newfoundland, pulp and paper mill. $50,000,000.

▲ Que., Bristol—PLANT—Steel Co. of Canada Ltd., Wilcox Ave., Hamilton, Ont., and Pickands Mather & Co., Union Commerce Bldg., Cleveland, O., U.S.A. iron ore development, incl. ore processing plant, rail line and hydro-electric power plant, 26 mi. east of Ottawa, $15,000,000.

UNCLASSIFIED

▲ Calif., San Diego—WIND TUNNEL—Convair, 3302 Pacific Hy., wind tunnel, $3,500,000.

▲ Colorado and Wyoming—GAS PIPE LINE—Colorado Interstate Gas Co., Colorado Springs National Bank Bldg., Colorado Springs, Colo., gas pipe line from Rock Springs Wyo. to Denver, Colo. $25,000,000. Preston Parks, 1303 E. Columbia St., Colorado Springs, Colo., consult. engr. CD 3/26/53.

▲ Georgia — RURAL DISTRIBUTION LINES — Satilla Rural Electric Membership Corp., Alma, 271 mi. rural distr. lines, sub-station facilities and sys. imprvs., Bacon Co. $1,915,000.

Mississippi—RURAL DISTRIBUTION LINES, etc.—Southwest Mississippi Electric Power Assoc., Lorman, 320 mi. rural distr. lines, sub-station facilities sys. imprvs., Copiah, $970,000. CD 2/28/49.

Mo., Pevely—CAMPING FACILITIES—Girl Scout Council of Greater St. Louis, 1839A Delmar Blvd., St. Louis, Zone 3, expansion of camping facilities incl. admin. bldg., dining hall, assembly auditorium, addnl. unit cabins, filtration sys., bath house, swimming pool, etc., near here, $500,000.

† S. D., Keystone—AMPHITHEATER—National Park Service, C between 18 and 19 Sts. N.W., Wash., D. C., amphitheater at Mount Rushmore National Park $750,000.

▲ Tex., Austin—COLISEUM—Travis Co., T. E. Johnson, county judge, Court House, plans by Fehr & Granger and Edwin J. Pfluger, 502 E. 5th St., coliseum, 350 ft. diam.; dome roof; elliptical shaped arena, 160 ft. wide, 300 ft. long. $2,350,000.

FOR REMOTE CONTROL JOBS on a great variety of CONSTRUCTION EQUIPMENT

TRU-LAY *Flexible* PUSH-PULLS

are Dependable and Accurate even under the most adverse conditions. They perform effectively under extremes of Heat or Cold . . . from jet engine temperatures to 70° below F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual Elimination of Maintenance.

Widely Used on Construction Equipment

Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on Tractors and their accessories, Power Shovels, Winches, Road Graders, Road Oilers, Dump Trucks, Snow Plows, Engine-driven Pumps, Rock Crushers, etc.

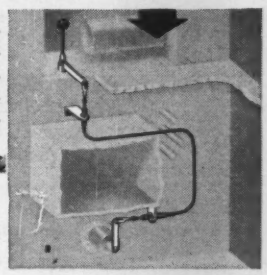
On Construction Equipment these dependable Push-Pulls are used for the remote control of Hydraulic and Air Valves, Brakes, Clutches, Transmissions, Throttles, Chokes, Governors, Power Take-Offs, and on many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances, up to 150 feet or more.

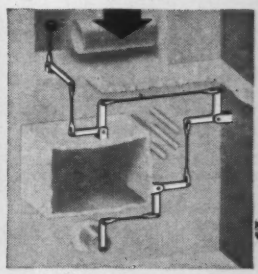
Advantages of TRU-LAY PUSH-PULL flexibility and simplicity are pictured below:

TRU-LAY PUSH-PULL

Simple
One Moving Part
Life-Time Service
Life-Time Accuracy
Low over-all Cost
Noiseless



MECHANICAL LINKAGES



Complex
Many Parts
Many Points of Wear
Increasing Back-Lash
Loss of Accuracy
Vibration
Rattles

"Solid as a rod but *Flexible* as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions as shown in the picture at the left . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, Accurate, Adaptable, Rugged . . . they are the ideal remote controls for Construction Equipment.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 26 Massachusetts
STREETS AND ROADS
April 26, 28 Massachusetts

† **R. I., Quonset Point**—ELECTRIC POWER, etc.—BA 4/26—P. Wks. Office, Bldg. 438, Naval Air Station, Quonset Point, imprv. electric power and compressed air service, large hangar area overhaul and repair Bldg. No. 60, NOY 86163, Spec. 44904. Plans deposit $10. CD 9/13/51.

Massachusetts—BA 4/28—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston, stone groin repairs sand filling shore reservation Myrtle Ave. and Moore St. $140,000. Plans deposit $2, refundable.

Mass., Boston—BA 4/28—Commonwealth of Mass., Metropolitan Dist. Comn., Water Div., 20 Somerset St., Proj. 213, furnish, lay water pipes, 12,500 lin. ft. 38 in. steel, Dedham, $280,000. Plans deposit $5, refundable.

† **R. I., Quonset Point**—RECREATION BLDG.—BA 4/28—P. Wks. Office, Bldg. 438, Naval Air Station, Quonset Point, repairs to enlisted men's recreation bldg., Naval Air Station, NOY 83578, Spec. 41469. Plans deposit $10. CD 9/13/51.

† **Me., Limestone**—PAVEMENTS—BA On Or About 5/5—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., pavements for motor pool exten. and vehicle storage area, Loring Air Force Base, ENG-19-016-55-124. $100,000-$150,000.

BIDS ASKED—BUILDINGS

Conn., Manchester—SCHOOL—BA 4/28—Town, Bd. Educ., Town Hall, elementary school, Keeney St. $345,000. Arnold Lawrence, 19 Bliss St., archt. CD 2/3/54.

Conn., Norwich—SCHOOL—BA 5/3—City Purch. Agt., City Hall, Greenville Elementary School, Golden St. $572,580. Plans deposit $15. John E. Maguire, 289 Main St., archt. J. C. Halliwell Assoc., 86 Weybosset St., Providence, R. I., engrs. CD 12/7/51.

▲† **Mass., Boston**—REHABILITATION ARMY BASE—BA On Or About 5/13—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, rehabilitation of wharves, piers and bldgs., Army Base, ENG-19-016-55-110. $10,000,000. Plans deposit $25. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 8/17.

SOON LETS CONTRACT—BUILDINGS

Conn., Greenwich—SCHOOL—St. Mary's Parish, Greenwich, soon lets contract parochial school, 2nd Unit $350,000. J. Gerald Phelan, 211 State St., Bridgeport, archt.

Mass., Gloucester — PLANT — O'Donnell-Usen Fisheries Corp., Commercial St., soon lets contract 1 story, 25,000 sq. ft. fish processing plant, office, warehouse, freezer and holding rooms, Commercial St. CD 12/29.

Mass., West Springfield—MONASTERY, etc.—Very Rev. Father Provincial, St. Michael's Monastery, Union City, N. J., soon lets contract, monastery-retreat house addn. $850,000. Brother Cajetan, J. B. Baumann, OFM, 44 Whitehall St., New York, N. Y., archt. CD 8/17.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Eugene R. Eisenberg, Inc.**, 30 Huntington Ave., Boston, Mass. LB $419,950, est. $750,000-$850,000. engine build up bldg., armament and electronics shops, Dow Air Force Base, ENG-19-016-55-104, BANGOR, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 5. CD 3/24.

Verrier Constr. Co., 65 Commerical St., Portland, Me. CA $489,100, est. $500,000. Contr. C-2 buildings, utilities Ferry Terminal, BAR HARBOR, ME. Canadian National Railway, R. O. Stewart, ch. engr., 360 McGill St., Montreal, Que., Canada. Bids Mar. 15. CD 3/1.

† **J. R. Cianchette**, 120 S. Main St., Pittsfield, Me. LB $181,295, est. $250,000-$300,000. contractors plant, rail facilities, Loring Air Force Base, ENG.-19-016-55-111, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 7. CD 3/28.

NEW HAMPSHIRE—State Dpt. P. Wks. & Hys., Concord, N. H.,

N.H.—James C. Mannix, Box 641, Holyoke, Mass., LB $121,112, asph. and peastone resurf. in central sect., Proj. T, Statewide;

N. H.,—Charter Oak Constr. Co., 525 Main St., Hartford, Conn. LB $198,274. road mix 1.677 mi. N. H. 119, Hinsdale. Bids Apr. 7. CD 3/25.

Manchester Sand, Gravel & Cement Co., Inc., P.O. Box 536, Manchester, N. H., LB $89,500, toll collectors station, canopy and accessories, Merrimack, NEW HAMPSHIRE. Dpt. P. Wks. & Hys., Concord, N. H. Bids Apr. 7. CD 3/28.

† **J. W. Praught & Co.**, 1803 Dorchester Ave., Dorchester, Mass., LB $605,648, est. $400,000-$500,000, roads, parking areas, utilities, heat distr. sys., Portsmouth Air Force Base, ENG-19-016-55-90, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 6. CD 3/28.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
J. F. White Contg. Co., 201 Alewife Brook Parkway, Cambridge, Mass. and **Consolidated Constr. Co.**, Draper Ave., North Attleboro, Mass. (joint venture) CA $4,719,719, est. $5,000,000. Contr. 51-092 hy. and bridge constr., Framingham and Natick. CD 3/15, under LB.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Grandview Constr. Corp., 740 S. Fulton Ave., Mount Vernon, N. Y. and **The Brunalli Constr. Co.**, 19 Main St., Southington, Conn. CA $3,370,276, est. $3,300,000. Contr. 51-191. hy. and bridge constr., Wilbraham and Palmer. CD 3/28, under LB.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
The Lane Constr. Corp., PO Drawer 911, Meriden, Conn. CA $6,209,290, est. $6,000,000. Contr. 51-110 hy. and bridge constr., Westfield and West Springfield. CD 3/21, under LB.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Clark Farrell Rogers Co., 401 Cotton Exchange, Memphis, Tenn. LB $4,462,561, est. $4,500,000. Contr. 51-072 hy. and bridge constr., Sturbridge. Bids Apr. 7. CD 2/28.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
A. J. Orlando Contg. Co., 151-59 Powels Cove Blvd., Whitestone, N. Y. CA $3,345,376, est. $3,400,000. Contr. 51-053 hy. and bridge constr., Brimfield and Warren. CD 3/11, under LB.

† **Platt Constr. Co.**, 99 First St., Cambridge, Mass. LB $513,000, est. $400,000-$500,000. engine build-up shops control tower, squadron supply bldg., hydrogen bldg., inflammable storage bldg., Hanscom Air Force Base, ENG.-19-016-55-96, BEDFORD, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Apr. 7. CD 4/6.

R. Zoppo Co., Providence Hy., Norwood, Mass. LB $842,689, est. $900,000. Contr. 202 Sect. 3 relief sewer, Abattoir Area to Watertown St., South Charles River, Boston, Newton and Watertown, BOSTON, MASS. Commonwealth of Mass., Metropolitan Dist. Comn., Constr. Div., 20 Somerset St., Boston, Mass. Bids Apr. 7. CD 3/21.

BUILDINGS

LOW BIDS AND CONTRACTS

R. H. White Constr. Co., Inc., 41 Central St., Auburn, Mass. CA Approx. $400,000. MANUFACTURING BLDG. Southbridge St., AUBURN, MASS. Gay Chrome Co., A. D. Wassall, pres., 25 St. Johns Rd., Worcester, Mass.

Joseph Rugo, Inc., 581 Boylston St., Boston, Mass. LB $947,000. JUNIOR HIGH SCHOOL, off Peach St., South Braintree, BRAINTREE, MASS. Town, Dist. School Development Comn., 10 Tremont St., South Braintree, Mass. Bids Apr. 7. CD 3/11.

Thomas A. Sotera Co., 133 S. Elm St., Bradford, Mass. CA Approx. $345,000. RESIDENTAL DEVELOPMENT, Rtes. 1 and 97, ROXFORD, MASS. Meredith Corp., c/o contractor. Linn W. Coffey, 759 Hale St., Beverly, Mass., archt.

Kay-Locke Inc., 11 Blossom St., Boston, Mass. CA Approx. $400,000. WAREHOUSE and OFFICES, Webster Ave. and Columbia St., SOMERVILLE, MASS. Ginsburg Bros., Inc., 561 Windsor St., Somerville, Mass. Bids Mar. 17. CD 3/7.

Neri Constr Co., 131 N. Main St., Millbury, Mass. LB $422,083, est. $350,000. Boys' Trade HIGH SCHOOL addn., alterations, Concord and Prescott Sts., WORCESTER, MASS, City, Trustees Independent Industrial Schools of Worcester, Grove St., Worcester, Mass. Bids Apr. 8. CD 4/5.

Frank W. Johnson & Son, 10 Dunn St., East Providence, R. I. CA $450,000. PAROCHIAL SCHOOL and CONVENT, Pawtucket Ave., Clifford St. and Bishop Ave., RUMFORD, R. I. St. Margaret's R. C. Parish, Rt. Rev. Msgr. Bernard J. Lennon, pastor, 42 Bishop Ave., Rumford, R. I. Bids Mar. 28. CD 3/8.

H. Wiles Lines Co., 134 State St., Meriden, Conn., CA, $700,000, 210x310 ft. mfg. plant and offices, Pine and Emmetts Sts., BRISTOL, CONN. Bristol Brass Corp., 580 Broad St., Bristol, Conn.

W. J. Megin, Inc., 51 Elm St., Naugatuck, Conn., CA, $570,000, Birdsey B. Norton ELEMENTARY SCHOOL and HIGH SCHOOL addns., CHESHIRE, CONN. Town, Bd. Educ., Town Hall, Cheshire, Conn. Bids Mar. 24. CD 3/29, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 27 Delaware
STREETS AND ROADS
April 21, 28, May 3 New Jersey May 5 New York

† **N. J., Bayonne**—BA 4/26—Dist. P. Wks. Office, 90 Church St., New York, N. Y., road repairs, resurf. north lane Stanley Bldg. Naval Supply Depot, Spec. 46906. Plans deposit $10.

New York—BINS, WALLS—BA 4/29—New York City Transit Auth. 370 Jay St., Brooklyn, Zone 1, reconstr. rubbish bins and retaining walls of 239th Street Yard, Lenox-White Plains Road Line, IRT Div., Bronx Boro, Constr. MS-111.

N. Y., Queens Village—ELECTRIC WORK—BA 5/5—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, electric work for heating tunnels and connections, Creedmoor State Hospital. Plans deposit $15. Bids Mar. 31 rejected, LB $244,600. CD 4/5, under LB.

BIDS ASKED—BUILDINGS

Md., Baltimore—SCHOOL—BA 4/27—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, fire department training school, drill tower, 2½ story bldg. to burn pit for oil fires, Pulaski Hy., near here. $350,000. Plans deposit $50. Frederick Thomas, 726 E. 33 St., Baltimore, Zone 18, archt. CD 10/17/52.

▲ **N. Y., New York**—HOSPITAL—BA 4/27—Dpt. P, Wks., Municipal Bldg., Zone 7, Contr. 1, general constr.; Contr. 2, plumbing; Contr. 3, heating and ventilating; Contr. 4 electrical work for constr. General Carl Hospital Bldg. and reconstruction in existing bldg., Harlem Hospital, Manhattan Boro. $7,000,000. Plans deposit $100. Extended date. CD 3/25

HEAVY CONSTRUCTION

BIDS ASKED—BUILDINGS

Queens Structure Corp., 32-57 57th St., Woodside, N. Y. CA $773,000. Long Island City Intercepting Sewers and Borden Ave. Pumping Station, Bowery Bay Sewage Treatment Works exten., Queens Boro. ASTORIA, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Mar. 16. CD 3/18, under LB.

Herbert F. Darling, 131 California Dr., Williamsville, N. Y., LB $330,057, est. $325,000, 25,000 lin. ft. sanitary sewer exten., trunk and lateral, vitr. tile, cross thruway and rail tracks, LACKAWANNA, N. Y. City, City Hall, Lackawanna, N. Y. Nussbaumer, Clarke & Velzy, 327 Franklin St., Buffalo, N. Y., engrs. and archts. CD 11/16/51.

Louis Longhi & Son, Inc., Box 580, Glens Falls, N. Y. LB $236,889, clearing, grubbing, paving, etc. for 1,000 ft. runway exten. with taxiway apron and additives. LAKE GEORGE, N. Y. Bd. Supervs. Warren Co., Lake George, N. Y. Bids Apr. 6. CD 3/25.

Max DiFiore & Sons, Inc., 204 Edgeland St., Rochester 9, N. Y., CA $331,611, Elmwood Ave. Relief Sewer, Buckland Creek-Elmwood Sewer, ROCHESTER, N. Y. Bd. Sewers Comrs., Brighton Sewer Dist. No. 2, Town of Brighton at Allen's Creek Disposal Plant, 412 Linden Ave., Rochester 10, N. Y. Bids Mar. 30. CD 3/2.

NEW JERSEY—New Jersey Hy. Auth., Roberts Estate, Eatontown,
Mohawk Constructors, Inc., 256 Bay Way, Elizabeth, N. J., LB, $124,649 Alt. A $128,565 Alt. B; Contract 185, Sects. 2 and 3, pedestrian overpasses at Pilch St., Bloomfield and New Sts., East Orange, Essex Co.; LB $142,899 Alt. A. $144,443, Alt. B, Contract 218, Sect. 3, pedestrian overpasses Delmar Pl., Argyle Terrace and 16 Ave., Irvington, Essex Co. Bids Apr. 7. CD 2/18.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Brookfield Constr. Co., Inc., 521 Fifth Ave., New York, N. Y., CA $2,759,236, Contract N-25A, 25B, 25C, concrete decks for portion of East Viaduct, West Viaduct and North Terminal ramps Newark Bay-Hudson County extension of N. J. Turnpike Jersey City, Hudson Co. Bids Mar. 29. CD 4/4, under LB.

NEW JERSEY—New Jersey Turnpike Auth., Administration Bldg., New Brunswick
Kingston Bituminous Products Co., Kingston, N. J. LB $426,080. Contract W-6, drainage, paving, landscaping at Service Areas 4N, 7S and 8N in connection with widn. N. J. Turnpike, Burlington and Middlesex Counties. Bids Apr. 5. CD 3/17.

▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comm., 11 N. 4 St., Harrisburg,
Lipsett, Inc., 210 S. 40 St., Phila., Pa., CA $4,490,743, constr. the T. J. Evans Tunnel (Sec. 36-DE) on northeastern exten., Lehigh and Carbon Counties. Bids Feb. 23. CD 2/25, under LB.

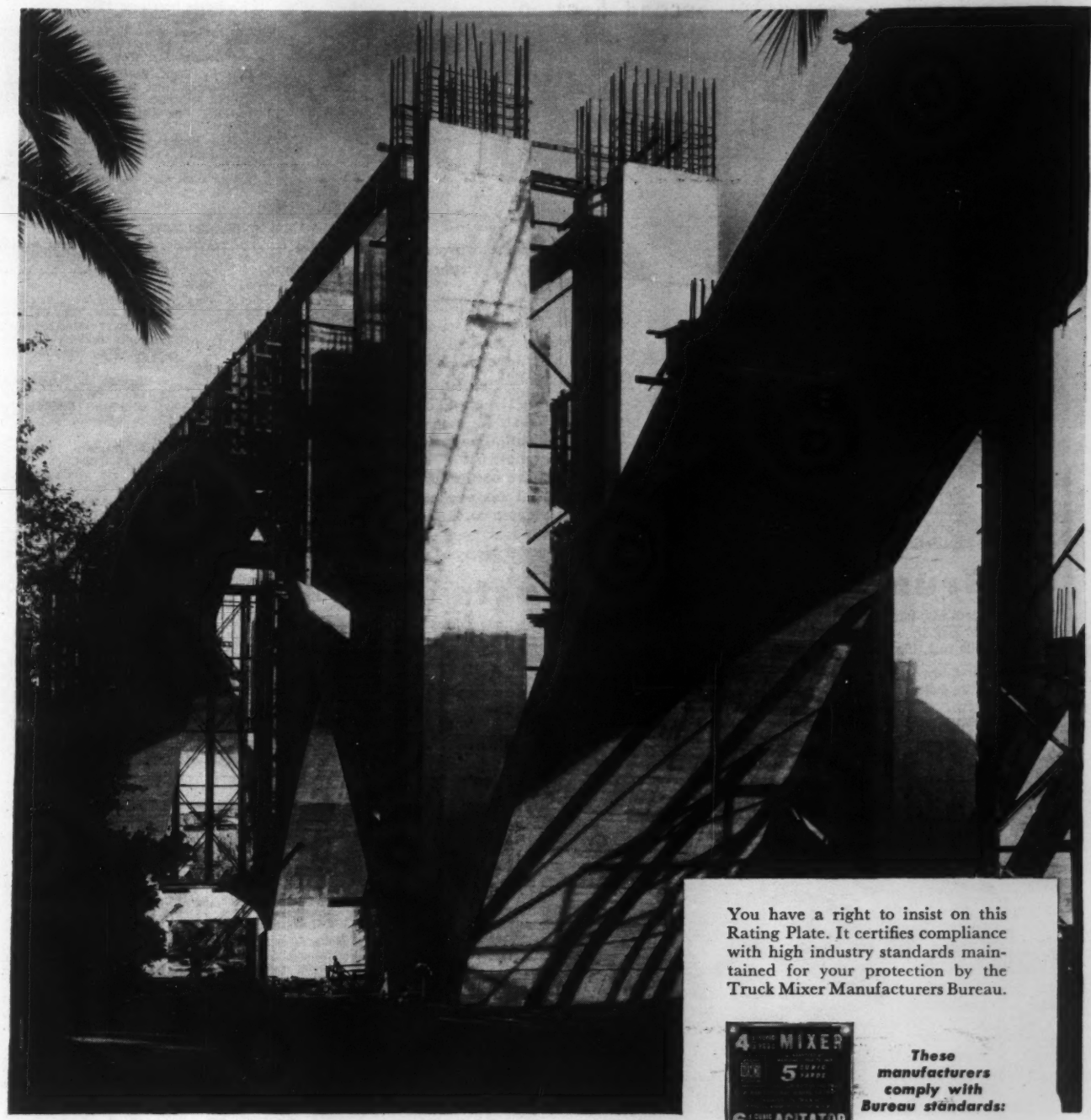
▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comm., 11 N. 4 St., Harrisburg,
W. E. Graham & Son, Cleveland, N. C., CA $1,760,358, const. 2.11 mi. (Sec. 37-H) northeastern exten. in Jenkins and Pittston Twps., Luzerne Co. Bids Mar. 8. CD 3/10, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Own Forces. $3,143,399, surf. tr. 2,713 mi. macad. highway in the state road sys.

PENNSYLVANIA—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Pa.—Alleghany Asphalt & Paving Co., 801 Bingham St., Pittsburgh 3, Pa., LB $197,320, widen 17,182 ft. road with crushed aggregate base and bit. surf. variable in width, T. R. 151, Independence and Hopewell Twps., Beaver Co.;
Pa.—Foster Grading Co., Jackson Center R. D. 2, Pa., LB $177,127, const. 7,830 ft. crusbed aggregate base with bit. surf. variable in width, precast concrete bridge, L. R. 10062 (R-1), Brady and Clay Twps., Butler Co.;
Pa.—Mayer Bros. Constr. Co., 1227 W. 18th St., Erie, Pa., LB $123,062, widen 6.853 ft. road with gran. slag base and bit. service various in width, T. R. 8, Mill Creek Twp., Erie Co.;
Pa.—New Enterprise Stone & Lime Co., New Enterprise, Pa., LB $289,282. constr. 21,857 ft. crushed aggregate base with bit. surf. 18 ft. wide, two rein.-con. bridges, T. R. 160, Stoney Creek Twp., Somerset Co. Bids Apr. 7. CD 3/2.

Warner & Co., Waynesboro, Pa. LB est. $73,000. swimming pool and facilities, Camp Airy, THURMONT, MD. Camp Airy Boys Camp, Thurmont, Md. Bids Mar. 22. CD 3/15.

(Continued on page 134)



Pasadena Pioneers Bridge. California Department of Public Works, Division of Highways. Guy F. Atkinson Company, Builders.

High, wide and handsome

"High, wide and handsome" aptly describes the Pasadena Pioneers Bridge. It equally describes today's bolder and more imaginative approach to concrete design by architects and engineers.

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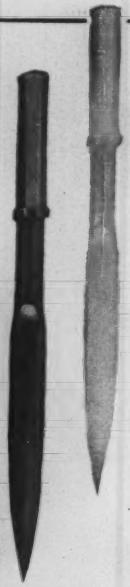

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(Continued from page 132)

† **The Okonite Co.**, Passaic St., Passaic, N. J., CA, $60,000, power and control cable, Dalecarlia Pumping Station, CIVENG-49-080-55-45, WASH., D. C. U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C.

DELAWARE—State Hy. Dept., Dover, **George & Lynch**, Delaware Trust Bldg., Wilmington, Del., LB, $324,806. hot mix asph. on c. conc. surf. 1.103 mi. Contract 1301, New Castle Co. Bids Apr. 6. CD 3/24.

† **Day & Co.**, 115 Federal St., Easton, Md., CA, $166,140, base theater, utilities, Dover Air Force Base, DOVER, DEL. U. S. Eng., 2635 Abbottsford Ave., Phila., Pa. Bids Mar. 9, awarded Mar. 18. CD 2/2.

BUILDINGS

LOW BIDS AND CONTRACTS

Lurio & Levinsky, c/o Morris Rothstein & Son, archts., 186 Joralemon St., Brooklyn 2, N. Y. Owner Builds. $750,000. 6 story APARTMENT, Ocean Ave. near Farragut Ave., BROOKLYN, N. Y.

▲ **O'Driscoll Constr. Corp.**, 347 Madison Ave., New York 17, N. Y., CA Est. $1,500,000. 2 story PALLETIZING BLDG. and BEER STORAGE, 105-19 Evergreen Ave., BROOKLYN, N. Y. Joseph Schlitz Brewing Co., c/o Kahn & Jacobs, archts., 2 Park Ave., New York 16, N. Y. Bids Mar. 14. CD 2/14.

Althea Associates, Inc., c/o Wechsler & Schimmenti, archts., 52 W. 46 St., New York 19, N. Y. Owner Builds. $600,000. Hewlett SHOPPING CENTER for 16-stores, Broadway and Piermont Aves., HEWLETT, N. Y.

Builders Associates, Inc., c/o E. B. Sheppard, 117 Chamberlain Dr., Buffalo, N. Y. CA $400,000. design and construct 80x300 ft., rein.-con. and concrete block, 24-lane BOWLING ALLEY, 1840 Abbott Rd., LACKAWANNA, N. Y. Abbott Alleys, Inc., c/o Dr. Louis F. Manze, 805 Abbott Rd., Buffalo, N. Y.

Claremont Gardens, Inc., c/o Lawrence M. Rothman, archt., 147 E. 125 St., New York 35, N. Y. Owner Builds. $800,000. 6 story APARTMENT, 27 Claremont Ave., MOUNT VERNON, N. Y.

▲ **Driscoll-Moccia Constr. Co.**, 41 E. 42 St., New York 17, N. Y., CA $7,411,711, general constr;.

Afgo Eng. Corp., 475 Adelphi St., Brooklyn 17, N. Y. CA $893,000, heating and ventilating;

Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York 29, N. Y., CA $907,770, plumbing;

E. A. Kahn & Co., Inc., 163-18 Jamaica Ave., Jamaica, N. Y., CA $600,000, electrical work for Robert F. Wagner Sr. HOUSES (Proj. No. NY-5-24), Sect. I, incl. Bldg. Nos. 1 through 13 (inclusive) in area bounded by a proposed new street, Franklin D. Roosevelt Dr., E. 120 St., and 1st Ave., Manhattan Boro, NEW YORK, N. Y. Grand total $9,812,481. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids Feb. 15. CD 2/17 under LB.

Green Meadows Homes, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. $360,000. 40 HOUSES, on tract near Railroad Station, RONKONKOMA, N. Y.

▲ **Gramercy Gardens at Sayville**, c/o Albert B. Meklenburg, 1038 Northern Blvd., Roslyn, N. Y. Owner Builds. $2,000,000. 186 HOUSES near LaSalle Military Academy, SAYVILLE, N. Y.

Fairview Ridge Estates, c/o Krugman & De Petro, 1330 Main Ave., Clifton, N. J. Owner Builds, $345,000. 15 HOUSES on tract near Fairview and Skytop Aves., CEDAR GROVE, N. J.

Molly Pitcher Estates, c/o Frederick W. Harsen, archt., Summit St. and East Railroad Ave., Tenafly, N. J. Owner Builds. $450,000. 30 HOUSES, on tract at Nokimis Ave. and Cedar St., OAKLAND, N. J.

Stratford Estates, c/o Arthur Williamson & Co., 484 Route 17, Paramus, N. J. Owner Builds, $350,000. 22 HOUSES, on 10-acre tract on Cripple Bush Rd. off Blanche Ave., OLD TAPPAN, N. J.

▲ **A. A. LaFountain, Inc.**, 161 Beech St., Hackensack, N. J., LB, $1,098,000. general contract new Princeton High SCHOOL WING, PRINCETON, N. J. Bd. Educ., Moore St., Princeton, N. J. Bids Apr. 5. CD 3/18

Troy Gardens Apartments, c/o William Chirgotis, archt., 968 Stuyvesant Ave., Union, N. J., Owner Builds, $500,000. 64 family APARTMENT, Spring St. near Harding Rd., RED BANK, N. J.

Gainsborough Garden Apartments, c/o Frederick W. Harsen, archt., Summit St. and East Railroad Ave., Tenafly, N. J. Owner Builds. $700,000. two story garden APARTMENT for 89-families on tract at Bogart Rd. and Howland and Reservoir Aves., RIVEREDGE, N. J.

Rolling Hills Estates, c/o Walter H. Kremer, 1300 Plaza Rd., Fairlawn, N. J., Owner Builds. $375,000. 25 HOUSES, on tract Pascack Rd. between Westgate Rd. and Oxford Place, WASHINGTON TWP., N. J.

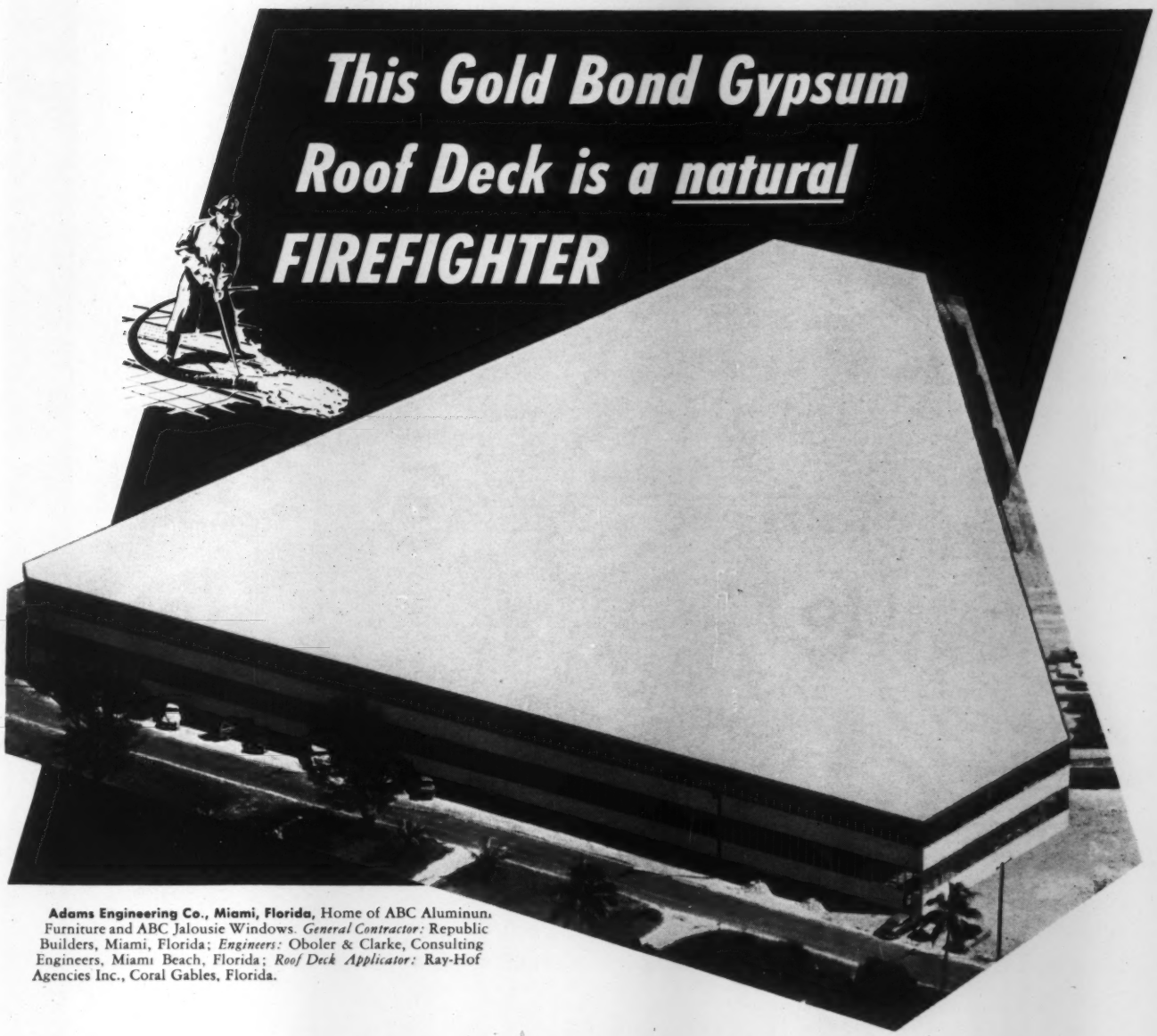
▲ **Graziano Constr. Co.**, 7321 Frankstown Ave., Pittsburgh, Pa., LB $2,143,300. 2 story brick block, JUNIOR HIGH SCHOOL, Peach and Cherry St., ERIE, PA. School Dist. of Erie, South Park Row and French St., Erie, Pa. Bids Mar. 23. CD 2/25.

▲ **North Park Village**, 2620 Market St., Youngstown, O. Owner Builds. $1,500,000. 2 story, 200x2,015 ft. steel, brick block SHOPPING CENTER, Ross Twp. PITTSBURGH, PA.

Edward M. Ryan, Inc., Beaver Hill Rd., Pittsburgh, Pa. Owner Builds. $500,000. 2-level, 80x200 ft., 40x60 ft., brick, block, steel deck St. Clair SHOPPING CENTER, Mt. Lebanon, PITTSBURGH, PA. J. Kenneth Myers, 3915 Saw Mill Run Blvd., Pittsburgh, Pa., archt.

(Continued on page 137)

This Gold Bond Gypsum Roof Deck is a natural FIREFIGHTER



Adams Engineering Co., Miami, Florida, Home of ABC Aluminum Furniture and ABC Jalousie Windows. *General Contractor:* Republic Builders, Miami, Florida; *Engineers:* Oboler & Clarke, Consulting Engineers, Miami Beach, Florida; *Roof Deck Applicator:* Ray-Hof Agencies Inc., Coral Gables, Florida.

This new addition to Adams Engineering's Miami plant gets extra safety from fire with its Gold Bond "Firefighter" Roof Deck. Over 120,000 square feet of incombustible gypsum was poured in place to form a natural, fire-resistant cover over the entire building.

"Firefighter" Roof Decks are adaptable to all roof designs—pitched, barreled or flat. Application is fast: it takes only *one day* to pour on *as much as 30,000 square feet!* Gypsum Roof Decks can be used with lighter supporting structures because of their low dead load. This feature lowers construction costs substantially. Maintenance costs are low, monolithic gypsum decks can be easily cut or patched to meet any future design modifications.

For full details on "Firefighter" Gypsum Roof Deck, write to National Gypsum Company, Buffalo 2, New York. Ask for Technical Bulletin No. 589 EN.

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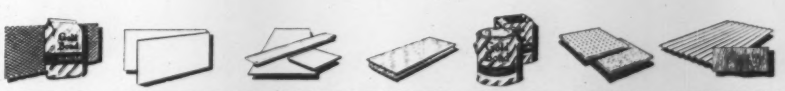

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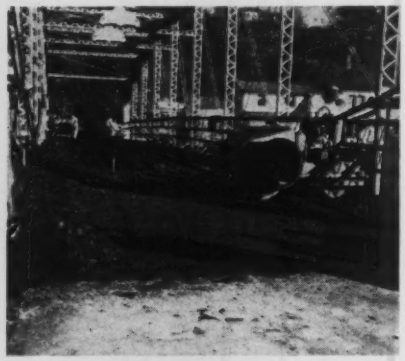
Steel Flooring Replaces Worn Planks on Rural Connecticut Bridge

When the plank flooring of this bridge near Seymour, Conn., needed replacing, the bridge was stripped to the stringers, repairs were made, and a new deck of Bethlehem Formed Steel Bridge Flooring laid down. Result: a strong, smooth, rattle-proof bridge floor, requiring little or no maintenance.



Rolling the surfacing material which covers the steel bridge floor.

Bethlehem Formed Steel Bridge Floor was easy to install. First, the worn planking was removed, then the Bridge Flooring was carried from the stockpile, where it nested compactly in small piles, to the bridge. After proper positioning, the 2-ft-wide corrugated steel plates were welded to the stringers, and adjacent plates welded together. In the case of wooden stringers, the steel floor is easily attached with lag screws and washers.

After a surfacing material was applied, the new bridge floor met all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on Bethlehem Formed Steel Bridge Flooring write or phone the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM STEEL

(Continued from page 134)

▲ **John McShain Inc.,** 3 W. Franklin St., Baltimore, Md. LB **$1,825,000.** Montebello Chronic Disease HOSPITAL, BALTIMORE, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Bids Apr. 7. CD 3/24.

Park Regent Co., 1101 Cloverdale Rd., Baltimore 17, Md. Separate Contracts. **$400,000.** 2 story, 159x206x25 ft, brick, frame APARTMENT HOUSE, BALTIMORE, MD.

Sun Constr. Corp., 5455 Wisconsin Ave., Chevy Chase, Md. CA Est. **$700,000.** OFFICE, Wisconsin and Western Aves., BETHESDA, MD. Chevy Chase Land Co., Union Trust Bldg., Wash., D. C. M. Bagley, 8555 Connecticut Ave., Chevy Chase, Md., archt.

▲ **V. L Vinella,** 5923 Second St. N.W., Wash., D. C. Owner Builds. **$1,740,000.** 116 brick split-level and rambler HOMES, on Windham Tract, Colesville Rd., SILVER SPRING, MD. J. D'Epagnier, 1004 Ripley St., Silver Spring, Md., archt.

John Williams, 2 Barclay Ave., Takoma Park, Md. CA Est. **$600,000.** SHOPPING CENTER Washington Ave., Washington Forest, UPPER MARLBORO, MD. Leo M. Bernstein, 1415 K St. N.W., Wash., D. C. Awarded Apr. 8. CD 3/1.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
April 29, Kentucky
STREETS AND ROADS
April 27 Louisiana April 29 Kentucky

† **Tenn., Knoxville**—ADMINISTRATION-RECREATION—BA 4/27—U. S. Eng., 303 U. S. Court House, Nashville, administration-recreation (gym), storage, ammunition and shop bldgs., grading of roadways and for utilities, McGhee-Tyson Air Force Base. $230,000.

BIDS ASKED—BUILDINGS

† **Fla., Jacksonville**—QUARTERS, etc.—BA 4/28—Sixth Naval Dist., Dpt. Navy, Bldg. 12, Charleston, S. C. married junior officers' quarters and married enlisted men's quarters, U. S. Naval Hospital, Spec. 45792. Extended date. CD 3/30.

Ky., Louisville—ASSEMBLY AREA—BA 5/2—General Electric Co., Appliance Park, concrete masonry assembly area. Hartstein, Louis & Henry, McDowell Bldg., archts. E. R. Ronald & Assoc., 554 S. Third St., Louisville, engrs. CD 2/24.

Ga., Hogansville—SCHOOLS—BA 5/10—State School Bldg. Auth., Kemper Bldg., 41 Exchange Pl. S.E., Atlanta, Hogansville High School addn. (White); West End Elementary & High School (Colored). Plans deposit $50. Bothwell & Nash, 208 Roswell St., Marietta, archts.

Ga., Covington—SCHOOLS—BA 5/17—State School Bldg. Auth., Kemper Bldg., 41 Exchange Pl. S.E., Atlanta, Newton Elementary and High School for colored; Covington Elementary School; Washington St. Elementary School addn. Livingston Elementary School Mansfield Elementary School, Palmer-Stone Elementary School; Newton County High School addn. and East Newton Elementary School, all in Newton County. Plans deposit $50. W. J. J. Chase & Assocs., 502 Candler Bldg., Atlanta, archts.

▲ **Va., Lynchburg**—HIGH SCHOOL—BA 5/18—Lynchburg School Bd., Dr. Paul Munro, supt., Lynchburg, Greater Dunbar High School addns., imprvs. $1,750,000. Pendleton S. Clark, Krise Bldg., archt. CD 11/10/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Rea Constr. Co.,** Box 2015, Charlotte, N. C., LB **$376,088,** Proj. 2A2, constr. ferry wharf and slip at Glass House Point, Colonial Parkway, James City Co., VIRGINIA. Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va. Bids Apr. 6. CD 3/16.

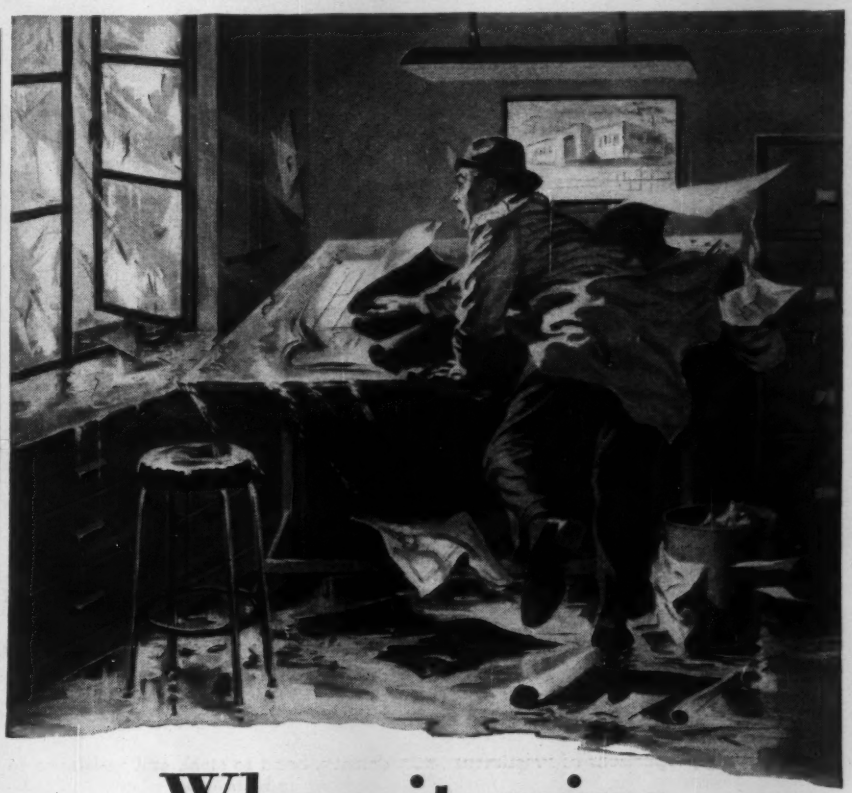
† **Robert M. Dunville & Bros., Inc.,** 214 S. Second St., Richmond, Va. LB **$434,808.** replacement of roof structure and repairs to Cold Storage Bldg. No. 40, Naval Supply Center (Cheatham Annex) NOY 85894, Spec. 53077, WILLIAMSBURG, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 5. CD 3/18.

Appalachian Electric Power Co., 40 Franklin Rd., Roanoke, Va. Own Forces. **$765,890,** 132 kv transmission line on steel towers 24.5 mi. Kanawha Plant to Capitol Hill Station, Kanawha Co., WEST VIRGINIA. CD 5/20.

† **Charleston Constructors, Inc.,** Adger's Wharf, Charleston, S. C., LB **$427,713,** special test facility bldg., boiler house and spur railroad tracks, Naval Ammunition Depot, North Charleston, NOY 76241, CHARLESTON, S. C. P. Wks Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids Apr. 6. CD 3/9.

† **Boyle Constr. Co.,** 30 E. Liberty St., Sumter, S. C. CA **$213,991,** armament and electronics shop, Myrtle Beach Air Force Base, ENG-38-081-55-48, MYRTLE BEACH, S. C. U. S. Eng., P.O. Box 905, Charleston, S. C. Bids Mar. 22. CD 3/2.

† **Craig-Roberson Constr. Co.,** 1610 Westminster Dr., Columbia, S. C., CA **$538,857,** double maintenance hangar with shops, Myrtle Beach Air Force Base, No. 38-081-55-49. MYRTLE BEACH, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids Mar. 29. CD 4/6, under LB.



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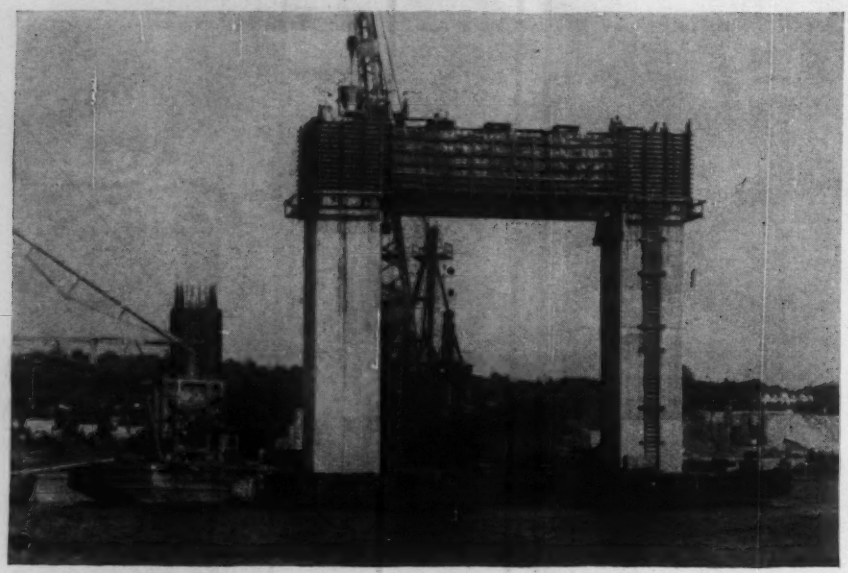

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† **Brinson Constr. Co.**, 51 St. and E. Broadway Ave., Tampa, Fla., CA, $597,000. dredging 750,000 cu. yds. rock from Florida Bay Flamingo, Everglades National Park, FLORIDA. Bureau P. Rds., Dpt. Commerce, Park Supt., Homestead, Fla. Bids Mar. 16, awarded Apr. 7. CD 3/30 under LB.

† **Jefferson Constr. Co.**, 3128 Coral Way, Miami, Fla., CA, $625,879, armament and electronics shop, Homestead Air Force Base, ENG-08-123-55-65, HOMESTEAD, FLA. U. S. Eng., P. O. Box 4970. Jacksonville, Fla. Bids Mar. 17. CD 3/23, under LB.

† **Fordice Constr. Co.**, Porter Bldg., Memphis, Tenn. CA $383,126, Lot I;

T. L. James & Co., Inc., P. O. Box 531, Ruston, La. CA $558,500. Lot II, furnishing, 40,000 squares articulated concrete mattress at Delta, Louisiana Casting Field, 60,000 squares articulated concrete mattress at Vidalia, Louisiana Casting Field, bank protection work in Lower Mississippi River Valley, ENG-55-115B, LOUISIANA. U. S. Eng., P. O. Box 60, Vicksburg, Miss. Bids Mar. 10. CD 2/21.

▲† **Farnsworth & Chambers Co., Inc.**, Box 74, Houston, Tex. CA $1,260,075. runway, taxiway extens., ENG-41-243-55-45, LAKE CHARLES, LA. U. S. Eng., Box 1229, Galveston, Tex. CD 3/29, under LB.

† **Pittman Constr. Co., Inc.**, 2925 Franklin Ave., New Orleans, La. CA $290,000. A. F. R. automotive garage bldg., public works shop bldg., Joint Air Reserve Training Center, Alvin Callender Field, (Belle Chasse), NOY 82595, Spec. 42635, NEW ORLEANS, LA. Officer in Charge of Constr., Eighth Naval Dist., Bldg. 16, Naval Station (Algiers), New Orleans, La. Bids Mar. 10. CD 2/16.

▲ **KENTUCKY** — Commonwealth of Ky., Dpt. Hys., Frankfort,

Schimpeler Constr. Co., 4023 Brook St., Louisville, Ky. CA $1,314,802. Lebanon Junction service area consisting of 1 story coffee-shop bldg., 2 service station bldgs., gasoline pump islands, near Lebanon Jct. and Shepherdsville on 40 mi. toll road from Louisville to point just south of Elizabethtown. CD 3/23, under LB.

† **R. B. Tyler Co.**, 1446 Levering St., Louisville, Ky. CA $789,731, est. $789,700. runway, taxiway extens. appurtenant facilities, Fort Campbell Air Force Base, FORT CAMPBELL, KY. U. S. Eng., 303 Federal Office Bldg., 7 Ave. and Broadway, Nashville, Tenn. Bids Mar. 30., awarded Apr. 5. CD 4/7, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Stone & Webster Eng. Corp.**, 1403 Roseneath Rd., Richmond, Va., CA $20,000,000, design and construct STEAM GENERATING POWER PLANT on York River near Yorktown and adjacent to American Oil Co. refinery, steam turbine generators, Hornsbyville, VIRGINIA. Virginia Electric & Power Co., 7th and Franklin Sts., Richmond, Va.

Ivy Constr. Corp., 920 Harris St., Charlottesville, Va., LB $398,745. DORMITORY, for Judge Advocate General School, CHARLOTTESVILLE, VA. University of Virginia, Colgate Darden, pres., Charlottesville, Va. Bids Apr. 5. CD 3/23.

C. L. Lewis, Inc., Stephenson Ave., Lynchburg, Va. CA $556,486. Central Y. M. C. A. DORMITORY, LYNCHBURG, VA. Lynchburg Young Women's Christian Assn., M. L. Driskell, exec. secy., Lynchburg, Va. Bids Mar. 30. CD 2/17.

Southeastern Constr. Co., 1121 Quarrier St., Charleston, W. Va., CA, $439,400. 1 and 2 story, steel, brick, block HEALTH and PHYSICAL EDUCATION BLDG., West Liberty State College, WEST LIBERTY, W. VA. W. Va. Bd. Educ., Capitol Bldg., Charleston, W. Va. Bids Apr. 6. CD 3/9.

Daniel Constr. Co., 429 N. Main St., Greenville, S. C. CA Approx. $250,000. 93,000 sq. ft. PLANT addn. to Utica and Mohawk Cotton Mills plant, CLEMSON, S. C. J. P. Stevens & Co. Inc., 1460 Boradway, New York, N. Y. Awarded Apr. 4.

The Gilbert Constr. Co., 624 13 St., Augusta, Ga., LB $464,147, Northside Junior High School, GREENWOOD, S. C. School Bd., Greenwood, S. C. CD 3/3.

Sun Ray Homes, Inc., 17401 N.E. 19 Ave., North Miami Beach, Fla. Owner Builds, $436,700, 53 RESIDENCES, NORTH MIAMI BEACH, FLA. Awarded Mar. 7.

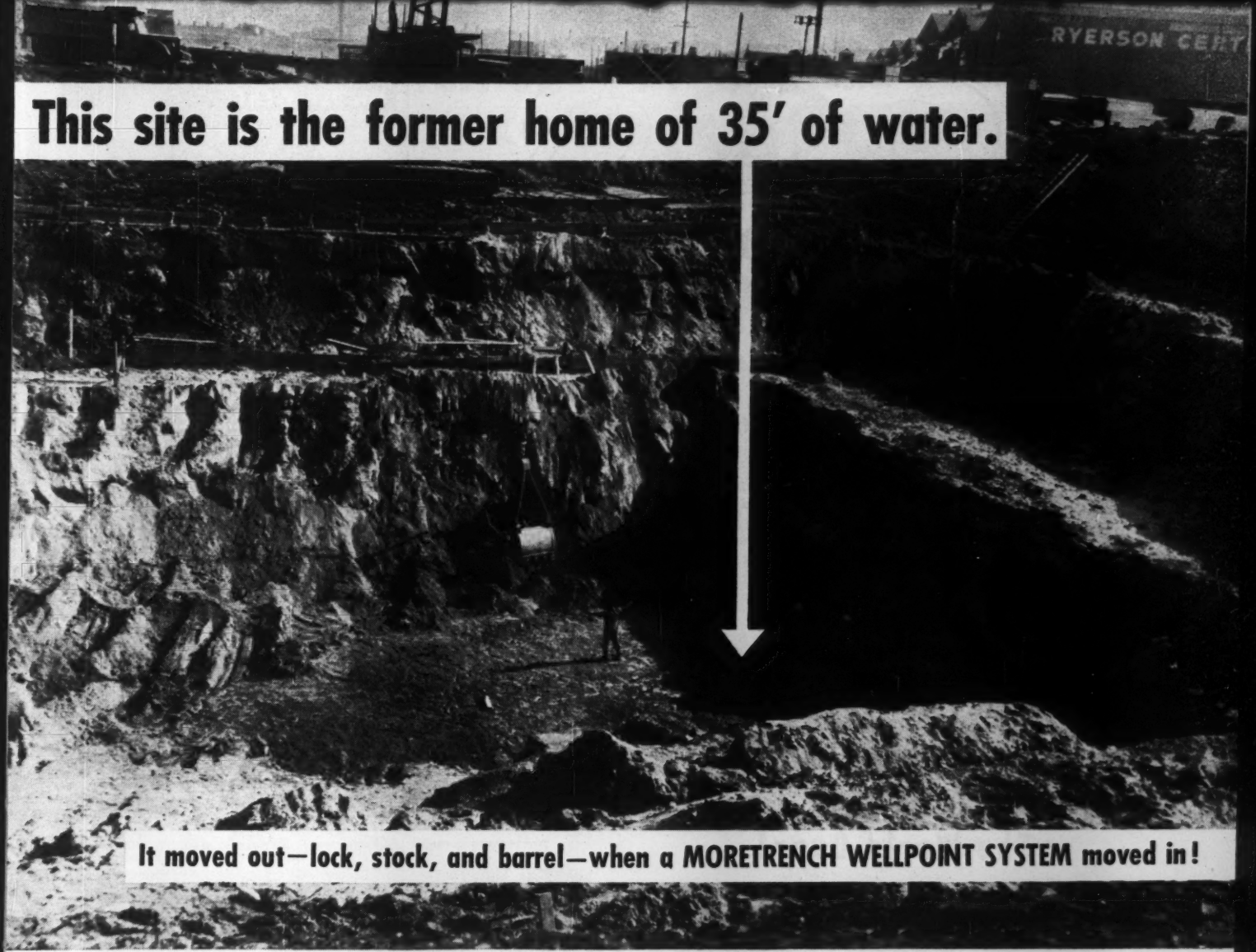
Perrilliat-Rickey Constr. Co., Inc., 1530 S. Rendon St., New Orleans, La. CA $588,500 est. $800,000. 4 story Calcasieu Parish JAIL, LAKE CHARLES, LA. Calcasieu Parish Police Jury, Courthouse, Bldg., Lake Charles, La., Bids Apr. 4. CD 3/21.

Caldwell & McCann, Box 477, Baton Rouge, La. LB $614,964, est.. $600,000. GYMNASIUM and ACADEMIC BLDGS., 45,000 sq. ft. for Francis T. Nichols Junior College, THIBODAUX, LA. State Bldg. Auth., Capitol Bldg., Baton Rouge, La. Bids Apr. 5. CD 3/15.

Geo. Pridemore & Sons, Inc., 1014 N. Lime St., Lexington, Ky., LB $586,000. plumbing, heating and ventilating contract for Cooperstown HOUSING, University of Kentucky, LEXINGTON, Ky. State, Div. Purchases, Frankfort, Ky. Brock & Johnson, 159 Barr St., Lexington, Ky., archts. Staggs & Fisher, 170 Walnut St., Lexington, Ky., engrs. Bids Apr. 5 CD 10/2/51.

† **Rock City Constr. Co.**, 4401 Kentucky Ave., Nashville, Tenn., LB $699,000, 64-room BACHELOR OFFICER QUARTERS, two bldgs., one 2 story L-shaped 54 room unit; and other 1 story 10 room unit, dining room, recreation room, TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. CD 11/14/49.

(Continued on page 140)


RYERSON CEMT
This site is the former home of 35′ of water.
It moved out—lock, stock, and barrel—when a MORETRENCH WELLPOINT SYSTEM moved in!

Rapid Digging IN THE DRY Speeds Construction of Jersey City's Sewage Treatment Plant.

Garden State Constructors and Associates, Jersey City, contractors for this portion of the city's $25,000,000 sewerage project, know how quickly water can sabotage the progress of any job. That's why for quick, sure results in this mixed-up material (garbage fill, sand, silt and clay layers), they selected Moretrench to do the pumping.

When you have to deal with water, deal with Moretrench. Experienced engineers in any of our offices will be glad to analyze your problem, estimate on your requirements. The know-how of thirty years of pumping is at your disposal.

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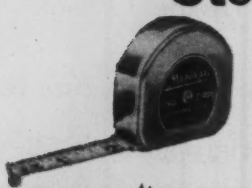


REGULAR MEZURALL

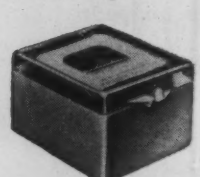
½" wide Chrome Clad blade in balanced mechanism—will not creep when extended. Self-adjusting end hook for hook-over or butt-end measurements. Markings in consecutive inches to 16ths both edges. 6, 8, 10 and 12 foot lengths.

SUPER MEZURALL

Rugged ¾" line extends farther unsupported. Diamond-shaped mark every 16" for easy rafter and stud spacing. Upper edge of line graduated feet and inches to 16ths, lower edge graduated consecutive inches to 16ths. Extra-long self-adjusting end hook. Case made of strong, featherweight magnesium alloy. 10 and 12 foot lengths.

LEADER CHROME CLAD

⅜" wide tempered steel line stays easy to read. Attractive case covered in durable maroon vinyl. Welded steel liner protected by a rust-resistant coating. Graduated feet, inches and 8ths. Available with regular or hook type end ring. 25, 50, 75 and 100 foot lengths.



360

FREE "SEE THRU" BOX All Chrome Clad Tape Rules are packed in a handy, reusable plastic box.

CHROME CLAD TAPE LINES are durable, do not surface crack, chip or peel and are rust and corrosion resistant. Jet black markings bonded to the line are protected by multiple electroplatings — they won't wear off and are always sharp and clear against the chrome white finish.

BUY LUFKIN TAPES • RULES • PRECISION TOOLS AT YOUR HARDWARE OR TOOL STORE

THE LUFKIN RULE CO., Saginaw, Mich.
Barrie, Ont.

(Continued from page 138)

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 26 Wisconsin

SOON LETS CONTRACT—BUILDINGS

Wis., Jefferson—SCHOOL—St. John the Baptist Catholic Congregation, Jefferson, soon lets contract 2 story, L shaped, 148x182 ft. parochial school. $425,000. John J. Flad & Assocs., 2525 University Ave., Madison, archts. CD 12/30.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

James McHugh Constr. Co., 6449 S. So. Park St., Chicago, Ill., CA $663,190, grit and grease removal plant addn. to sewage plant, TOLEDO, O. City, City Hall, Toledo, O. Bids Mar. 1, awarded Apr. 6. CD 3/15, under LB.

▲ ILLINOIS—State Div. Hys., Springfield. rejected bids Apr. 1, bit. resurf. 2.88 mi. S.B.I. Routes 50 and 57 (Cicero Ave.) Chicago, Cook Co., LB, $158,940; bit. resurf. 1.42 mi. S.B.I. 5 and 18 (Ogden Ave.) in Chicago, Cook Co.; LB $95,131; c. conc. 0.5 mi. F.A. 131 (Congress St. Expressway) Chicago, Cook Co., LB $1,519,687. CD 4/6, under LB.

▲ Thomas McQueen, 1313 Circle Dr., Forest Park, Ill., CA $2,099,175, bridge over C.B.&Q.R.R. Yards on 52 Ave., CICERO, ILL. City, City Hall, Cicero, Ill. Bids Mar. 5, awarded Apr. 6. CD 3/15, under LB.

Mercury Builders, Inc., 5412 North Ave., Chicago, Ill., LB $393,471, sewage treatment plant;

Advance Constr. Co., 422 W. Chestnut St., Hinsdale, Ill., LB $170,000. pumping station, LOMBARD, ILL. Village, Village Hall, Lombard, Ill. Bids Apr. 4. CD 3/23.

WISCONSIN—State Hy. Comm., State Office Bldg., Madison

John F. Bloomer Co., 341 W. College Ave., Appleton, Wis., CA $596,796, Contract 1, base, b. conc. 5.2 mi. West County Line-Morris (Marathon Co. line-East Junction U. S. H. 45) Road, U. S. Hy. 45 and S.T. Hy. 29, Shawano Co. Bids Mar. 22. CD 3/25, under LB.

† J. H. Findorff & Son, Inc., 601 W. Wilson St., Madison, Wis., CA $672,113, maintenance hangar and shops, Truax Field, ENG-47-013-55-12, MADISON, WIS. U. S. Eng., 428 Federal Bldg., Milwaukee 1, Wis. Bids Mar. 15. CD 4/25, under LB.

Payne & Dolan of Wisconsin, Inc., 735 N. Water St., Milwaukee, Wis., LB $141,146, bit. surf. runways, General Mitchell Field;

J. P. Humphries, Inc., 3269 N. 48 St., Milwaukee, Wis., LB $181,928, grading, draining, paving, lighting Curtiss-Wright Airport, MILWAUKEE, WIS. Milwaukee Co., Court House, Milwaukee, Wis. Bids Apr. 7. CD 3/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Murphy Builders, Inc., 1531 Gardenwood Ct., Cincinnati, O. Owner Builds. $1,230,000. eighty-two 1½ story, brick bsmnt. HOMES, Monsanto Dr., CINCINNATI, O. Ayers Graf, 527 Linton St., Cincinnati, O., engrs. Awarded Apr. 8.

F & Y Building Service, Inc., 319 E. Town St., Columbus, O., CA $542,595, general contract 3 story LAW COLLEGE CLASSROOM-ADMIN. BLDG., COLUMBUS, O. Ohio State University, N. High St., Columbus, O. Bid Mar. 31. CD 2/17.

Baker & Shindler, Defiance, O., CA, general constr.;
G. H. Voight Co., Defiance, O., CA heating, plumbing and ventilating;

Central Electric Contg. Co., 512 W. Washington St., Fort Wayne, Ind., CA, grade SCHOOL, HICKSVILLE, O. Bd. Educ., Dr. R. E. Hofmeister, pres., Hicksville, O. Est. $490,000. Awarded Apr. 5. CD 5/13.

Cahokia Land & Development Co., Oliver L. Parks, pres., Cahokia, Ill., Own Forces, $600,000. 150 prefabricated RESIDENCES, St. Joseph Gardens Subdivision, incl. 9 macadam streets through 90-acre tract at southwest corner of Routes 3 and 157, CAHOKIA, ILL.

▲ Centreville Township Hospital, Francis Touchetee, bd. chn., City Hall, 4800 Bond Ave., Centreville Twp., East St. Louis, Ill., rejected bids Apr. 6, 3 story part bsmnt., main portion 56x320 ft., one wing 56x80 ft., another 56x65 ft. 125-bed brick, steel, rein.-conc. HOSPITAL, CENTERVILLE TWP. (east St. Louis, P.O.), ILL. LB $2,612,737. Will re-advertise.

▲ Joseph J. Duffy Co., 4994 Elston St., Chicago, Ill., LB $5,317,829, Dunbar SCHOOL, Calumet, South Parkway and 31 Sts., CHICAGO, ILL. Bd. Educ., 221 N. La Salle St., Chicago, Ill. Bids Apr. 1. CD 3/1.

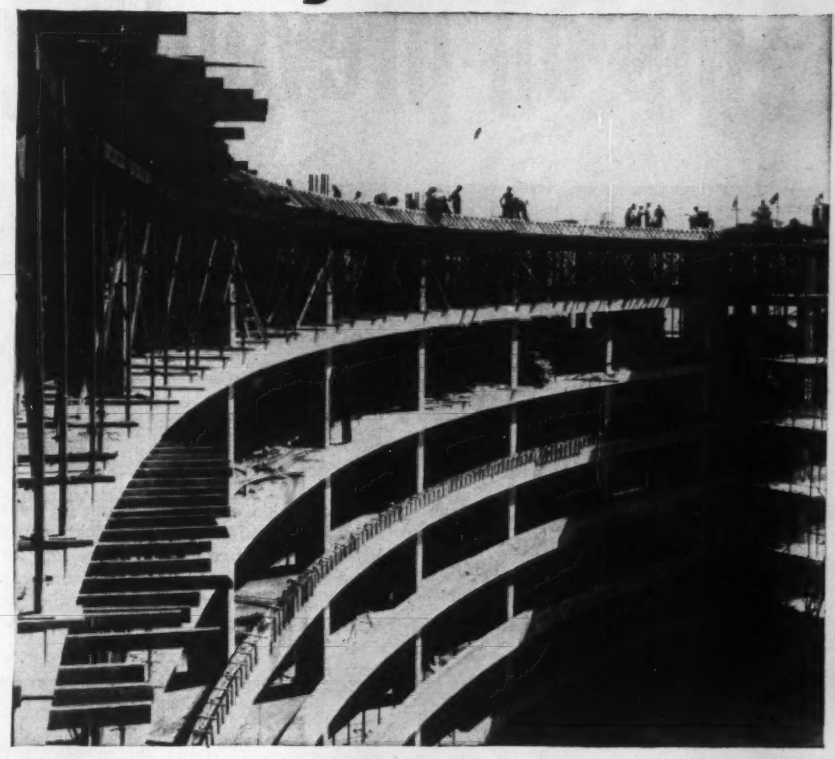
▲ Gerhardt Meyne Co., 300 W. Washington St., Chicago 6, Ill., CA, $1,000,000. superstructure only 6 story OFFICE BLDG., CHICAGO, ILL. American Dental Assoc., 220 E. Superior St., Chicago 11, Ill. Childs & Smith, 20 N. Wacker Dr., Chicago 6, archts. Awarded Apr. 4. CD 11/9.

S. N. Nielsen Co., 3059 Augusta Blvd., Chicago 12, Ill., LB $624,000. 11 row HOUSES, 41 units, 47 and Princeton Sts., CHICAGO, ILL. Chicago Dwellings Assoc., 69 W. Washington St., Chicago 2, Ill. Bids June 9. CD 5/26.

(Continued on page 144)

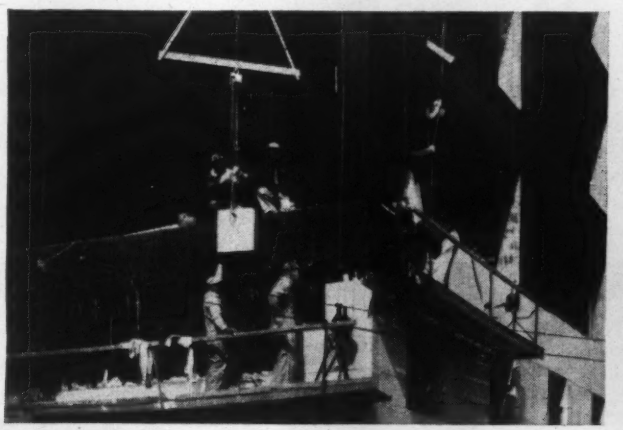
(Advertisement)

Scaffolding Methods . . . by Patent Scaffolding Co.

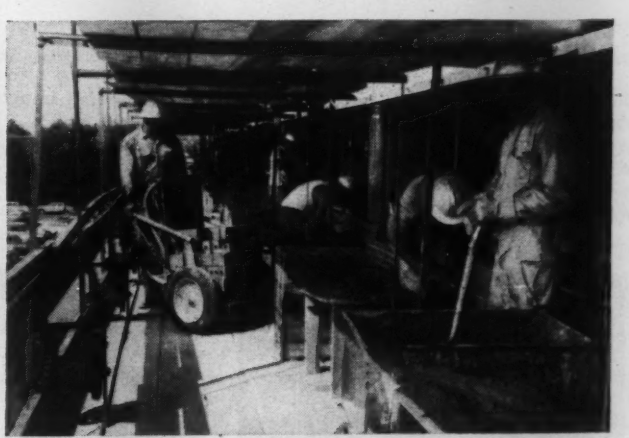


CURVES ON MIAMI BEACH—Three different types of PS Scaffolding can be seen doing three different jobs on the 14-story, $14,000,000 Fontainbleau Hotel that curves 440' along the ocean front at Miami Beach. While 5-ft. wide "Trouble Saver"® Shoring frames are supporting formwork for 10th floor, single post Burton's Shores are being used for reshoring on the lower floors. At right, "TubeLox"® Scaffolding makes runways for wheeling concrete from hoist tower. Taylor Construction Co., general contractor.

WORLD'S TALLEST—Materials for three 707-ft. (from foundations) chimneys being built for the Indiana-Kentucky Electric Corp. near Madison, Ind. are hoisted by "Gold Medal"® Steel Hoist Towers 721 ft. 6 in. high. Custodis Const. Co., chimney contractor.



TEAMED UP FOR SPEED—"Gold Medal" Junior Safety Swinging Scaffolds and a block and tackle stone-lowering arrangement keep stonesetting job moving at a rapid pace on the Prudential Life Insurance Bldg., Minneapolis. 15 of these light duty Scaffolding Machines, with 20-ft. platforms, keep men at correct working height as work advances. Block and tackle, hung from trolley beams on roof, rolls and lowers stone to men. Stonesetting contractor, Axel Ohman. General contractor, C. F. Haglin & Co.



TREND TO MECHANIZATION—A clear area for maneuvering buggy loaded with half-pallet (120 bricks) to masons' stations is provided by 8-ft. wide "Gold Medal" Safety Scaffolding Machines. Scaffolding Machines are set away from wall to give masons an unobstructed 20-in. platform. This specially-designed PS Scaffolding, required by palletizing and mechanized handling of masons' materials, is furthering the trend to more efficient operations. Job is Cedar Apts. Extension, Cleveland. Mason contractor, W. M. West & Son.

To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

THE PATENT SCAFFOLDING CO., Inc.

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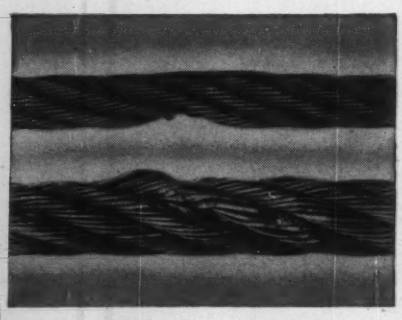
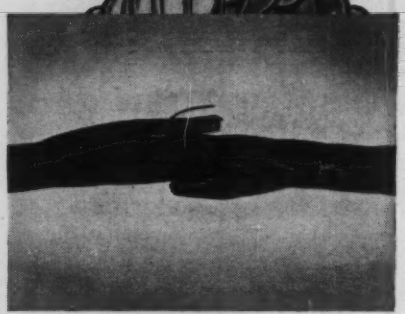
Tuffy® tips on preventing

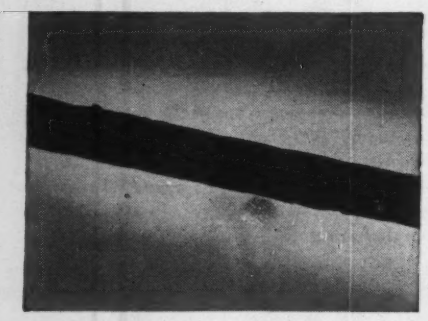


These two photos show what happens when rope is run over or struck by a hard object and crushed. The damage to the strands greatly reduces the service life so carefully built into the rope.

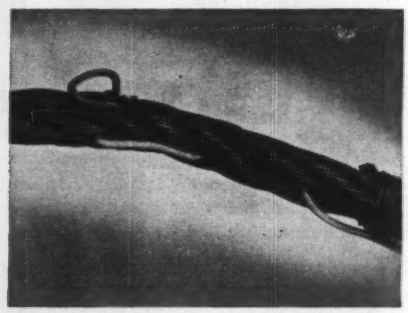
Sudden release rebound from an overstressed condition may often cause birdcaging. Throwing a loop into the rope is also a major cause of birdcaging. Lang Lay ropes in particular are vulnerable to this abuse.



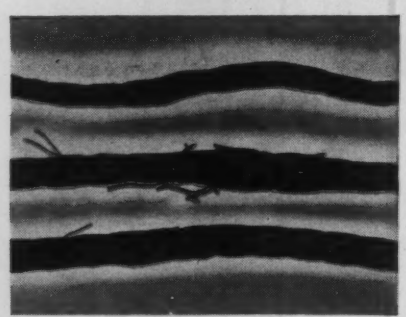
Severe corrosive water conditions caused rust and corrosion to produce a one-strand break in this rope. Lubrication during the time the rope was in service would have retarded the damage . . . added greatly to the rope's life.



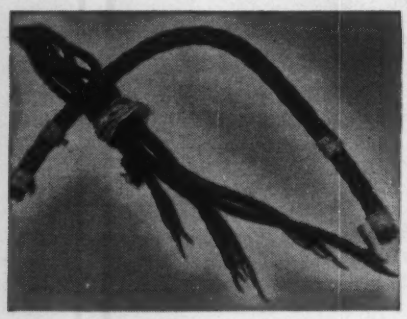
If broken in improperly, high strands like these may result. When installing, make sure that the fabricated relation between *strand with strand* and *strands with core* are not changed.



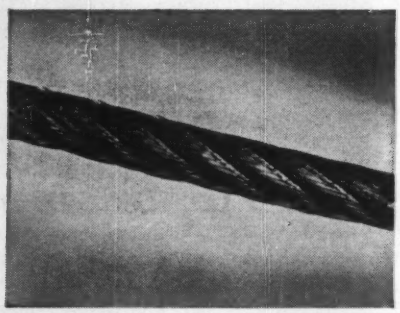
Nailing a wire rope through the core often causes many undesirable results. The wires and the core are badly damaged. A high strand may develop near the end or many feet away.



Here are three types of open kinks, all resulting from mishandling of wire rope. Guard against kinks by winding rope properly on the drum, and *never* pull a loop smaller, always enlarge it then straighten out the rope.

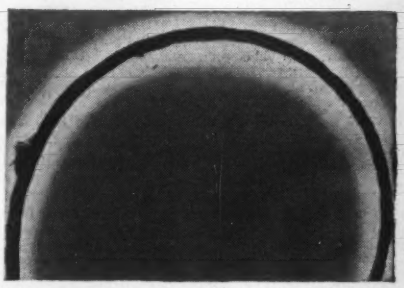


The start and finish of doglegs; the end being the point when all the wires on one side of the rope were worn through. Anything, such as a pulled loop, that causes a permanent bend or "set" will result in a dogleg.



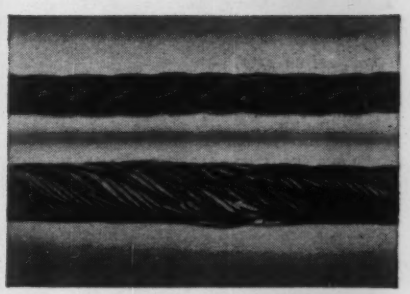
While different wire rope is constructed to resist abrasion to different degrees, improper use leads to injury. Watch for abrasion and when it begins to show locate the point where it is occurring and correct the cause.

damage to *Wire Rope*



When a popped core occurs, continued use causes the rope lay to lengthen out considerably. This displacement of the core is usually caused by load tension being suddenly removed from the rope.

Here is an example of excessive pinching in the sheave grooves. This rope lasted through only 1½ hours of service. To prevent pinching, make sure grooves are not worn deep and that the bearing surface is sufficiently large.



Excessive drum crushing like this occurs at points of cross-over or when rope is wound unevenly. Check for even winding of each layer on the drum to prevent crushing of this type.

Put the Knowledge of Specialists to Work on Your *Wire Rope* Problems

Their years of field-testing experience and solutions arrived at and proved both in the field and in our outstanding wire rope laboratory are yours to make use of whenever a rope problem confronts you.

In addition to standard wire ropes, Union Wire Rope specialists have produced a family of wire ropes for special purposes. Ropes that give you the construction, type of steel and characteristics best suited to each particular job for which each of the Tuffy Wire Ropes is especially designed and constructed.

The Tuffy Ropes they have developed make ordering easy and *sure*. Next time you want wire rope, just...

Say Tuffy—No Need For Complicated Specifications

Tuffy Scraper Rope
Mount a reel on your scraper and move more yardage per foot. Flexible to resist sharp bends, stiff enough to resist looping and kinking.

Tuffy Dragline
Rides smooth on drums and hugs the drum when casting. Extra flexible, yet constructed to give maximum abrasive resistance.

Tuffy Dozer Rope
Mounted on special 150′ reel that lets you use rope you now throw away! Increases service life and reduces down-time. 1/2" and 9/16".

Tuffy Slings & Hoist Line
A hoist line that gives you extra service life. Slings of 9-part machine-braided wire fabric fight kinking — a matched team of balanced performers.

Your Union Wire Rope Distributor Is Good At Solving *Wire Rope* Riddles. When you have a wire rope problem, give your Union Wire Rope distributor a call for hurry-up service. Chances are you'll find he has the correct answer at hand—because part of his job is figuring out how your equipment can give you the best operation, at the lowest operating cost! Feel free to call on him anytime.

union *Wire Rope* corp.

2228 Manchester Avenue, Kansas City 26, Mo.

Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

3

(Continued from page 140)

▲ **Paschen Bros. Constr. Co.,** 2739 Elston St., Chicago, Ill., CA, **$1,266,923,** OFFICE, Rush and Erie Sts., CHICAGO, ILL. Sanitary District of Chicago, 910 S. Michigan Ave., Chicago 54, Ill. Bids Mar. 18, awarded Apr. 4. CD 3/30, under LB.

Mercury Builders, 5412 North Ave., Chicago, Ill., LB **$915,831,** four SCHOOLS addns., LYONS, ILL. School Dist. No. 103, 41 and Joliet Ave., Lyons Ill. Bids Apr. 5. CD 3/24.

▲ **Kenneth P. Johnson,** 1105 W. Larence Ave., Chicago, Ill., CA **$1,000,000,** 100 unit 30 row HOUSES, Dempster and McDaniel Sts., SKOKIE, ILL. Retirement Homes, Inc., 4723 Broadway, Chicago, Ill. Awarded Apr. 4.

▲ **Geo. Sollitt Constr. Co.,** 109 N. Dearborn St., Chicago 2, Ill., LB, **$1,406,882,** HOSPITAL, 1324 Sheridan St., WAUKEGAN, ILL. Victory Memorial Hospital, 1324 N. Sheridan Rd., Waukegan, Ill. Bids Mar. 23. CD 3/15.

Ben B. Gauther, 22 Washington Blvd., Oshkosh, Wis., LB **$730,526,** general contract FOOD SERVICE and LAUNDRY, at State Hospital, WINNEBAGO, WIS. State Dpt. P. Welfare, Madison, Wis. Bids Apr. 1. CD 3/15.

▲ **Harvard Realty Co.,** 16738 E. Warren St., Detroit, Mich. Owner Builds. **$1,000,000.** development block, 14 RANCH HOUSES, TERRACE APARTMENTS, SHOPPING CENTER, Harper, Cadieux, Berden, and Harvard Sts., DETROIT, MICH.

▲ **Leslie-Dennis Constr. Co.,** 13033 Warner St., Dearborn, Mich. CA Est. **$1,500,000.** Woodside Development, 140 single brick ranch HOMES, TRENTON, MICH. Rose Hill Realty Co., 14601 E. Seven Mile Rd., Detroit, Mich.

▲ **Joseph J. Beaufait,** 20502 Harper St., Harper Woods, Mich. Owner Builds. **$2,375,000.** Sunny Acres, 198 brick HOMES, M-97, WARREN, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
April 29, Missouri, North Dakota
STREETS AND ROADS
April 29 Missouri, North Dakota

▲† **N. M., Alamogordo** — INDUSTRIAL-TECHNICAL FACILITIES—BA 4/28—U. S. Eng., Box 1538, Albuquerque, industrial and technical facilities, incl. 3 story, 51x156 ft. data reduction and test bldg.; wing; 143x182 ft. missile assembly bldg.; two 204x267 ft. technical proj. bldgs.; water, sewers, paving, etc., Holloman Air Force Base, Inv. No. ENG-29-005-55-79. $500,000-$1,500,000. CD 3/30.

▲† **Tex., Fort Worth**—HOSPITAL—BA About 6/7—U. S. Eng., 100 W. Vickery Blvd., Fort Worth, 195,000 sq. ft. 250-bed hospital, drilled pier fdn., site grading, parking center, etc. Carswell Air Force Base, Inv. No. ENG-41-443-55-123. $1,000,000-$2,750,000. CD 10/31/51.

BIDS ASKED—BUILDINGS

Neb., North Platte—HOSPITAL—BA 4/27—Memorial Hospital (Lutheran Hospital & Home Society), North Platte, Memorial Hospital. $450,000. John Latenser & Sons, 1307 Farnam St., Omaha, archts. CD 3/26/53.

SOON LETS CONTRACT—BUILDINGS

Tex., Freeport—SHOPPING CENTER—Freeport Land Co., c/o Dan M. Moody, Abstract & Title Bldg., Houston, soon lets contract const. Unit 1 (2 bldgs., "A" and "B"), 44,750 sq. ft. masonry shopping center, called Tarpon Inn. $400,000. Irving R. Klein & Assocs., 1317 Austin St., Houston, archts. H. E. Bovay, Jr., M. Esperson Bldg., and Walter P. Moore, 2 Pinedale St., Houston, engrs. CD 3/17.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Hallett Constr. Co., Crosby, Minn. CA **$817,340.** paving, shoulder grading 13.3 mi. on TH 75, S. P. 5407-12, under Contr. 8256, Norman Co. Bids Mar. 11, awarded Mar. 29. CD 3/16, under LB.

W. D. Giertsen Co., 900 Glenwood Ave., Minneapolis, Minn. LB **$642,098.** furnish, install about 90,000 lin. ft. 9 in. vitr. sewers, RICHFIELD (MINNEAPOLIS P.O.), MINN. Village, P. H. Haugen, clk., 6700 Portland Ave., Richfield (Minneapolis 23), Minn. Bids Apr. 7. CD 3/22.

IOWA—State Hy. Comm., Ames,

Booth & Olson, Inc., 529 Insurance Exchange Bldg., Sioux City, Ia., CA, **$512,867,** c. conc. 9.121 mi. F-3 (9) Jefferson Co. Bids Apr. 5. CD 4/13, under LB.

▲ **IOWA**—State Hy. Comn., Ames,

Ia.—**Booth & Olson, Inc.,** 529 Insurance Exch. Bldg., Sioux City, Ia., LB, **$512,868,** c. conc. 9.121 mi. F-3 (9) Jefferson Co.; LB **$204,211,** c. conc. pavement wid'n. 13.203 mi. FN-782, Buchanan and Fayette Counties; LB **$251,902,** c. conc. pavement wid'n. 17.427 mi. P-538, Franklin and Hardin Counties; LB **$191,564,** c. conc. pavement wid'n. 13.372 mi. P-1023, Polk and Warren Counties;

Ia.—**Central Constr. Co.,** Indianola, Ia., LB, **$329,120,** c. conc. 2.091 mi. U-23 (6) Marshall Co.;

Ia.—**Central Eng. Co.,** 2531 Rockingham Rd., Davenport, Ia., LB, **$130,517,** c. conc. pavement wid'n. 8.2 mi. P-204, Scott Co.; LB **$103,101,** b. conc. resurf. 2.53 mi. FN-540, Lee Co.;

Ia.—**W. Hodgman & Sons, Inc.,** Fairmont, Minn., LB, **$381,012,** b. conc. 10.522 mi. F-419 (13), Jackson Co.;

Ia.—**Everds Bros.,** Algona, Ia., LB, **$141,808,** b. conc. 6.447 mi. S-899 (3), Mitchell Co.;

Ia.—**Kaser Constr. Co.,** 3111 Ingersoll St., Des Moines, Ia., LB, **$316,055,** b. conc. 8.872 mi. Special FN-945, Poweshiek Co.;

Ia.—**Lee & Johnson, Inc.,** 215 Insurance Exchange Bldg., Sioux City, Ia., LB **$107,803,** b. conc. 6.459 mi. 55-A-T, Webster Co.; LB **$142,378,** b. conc. 8.899 mi. S-298 (3) Webster Co. Bids Apr. 5. CD 3/23.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,

Mo.—**C. H. Atchison Paving Co.,** Chillicothe, Mo. CA, **$1,015,833,** c. conc. Lawrence Co.

Mo.—**St. Joseph Fuel & Mfg. Co. and Clark Constr. Co.,** P. O. Box 350, 1207 S. Fourth St., St. Joseph, Mo. CA, **$997,321,** c. conc. 8.317 mi. Linn Co. CD 3/4, under LB.

† **Shanahan Constr. Co.,** Clayton, Mo. CA, **$700,191.** storage facilities for ordnance storage area, roadways, 4 concrete storage igloos, concrete frame bldgs., electric distr. sys., water sys., sewerage sys., septic tanks, security fencing, Sedalia Air Force Base, SEDALIA, MO. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids Mar 25, awarded Mar. 31. CD 4/6, under LB.

† **Burns & Swilley Contractors, Inc.,** Bossier City, La., LB **$387,216;**

Patton-Tully Transportation Co., 1242 N. 2 St., Memphis, Tenn., LB **$135,000** Base, **$210,000** Alternate, Sch. II, rockfill dike in existing dike lines at Wilson Rock to Fort Smith to Fort Smith, CIVENG-55-59, ARKANSAS. U. S. Eng., P.O. Box 61, Tulsa, Okla. Bids Mar. 9. CD /10.

† **Missouri Valley Dredging Co.,** 222 William St., Omaha, Neb., LB **$320,500,** excavation of pilot canal at Missouri River also dredging, near Decatur, Inv. 25-066-55-111, NEBRASKA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids April 8. CD 3/16.

▲† **Robert E. McKee General Contractors, Inc.,** 221 Washington Ave., Santa Fe N. M., CA **$8,662,464,** SAC control center, Offutt Air Force Base, ENG-25-066-55-61, FORT CROOK, NEB. U. S Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 5. CD 4/8, under LB.

KANSAS—Kansas Turnpike Auth., 2306 W. 10 St., Topeka,

Rhoades Constr. Co., Inc., P. O. Box 225, Newton, Kan. CA, **$504,491,** eight continuous steel beam, one welded steel girder bridges, Proj. 3-10-B (1), Butler Co. CD 4/5, under LB.

KANSAS—Kansas Turnpike Auth., 2306 W. 10 St., Topeka,

Kan.—**J. A. Tobin Constr. Co.,** 3701 Rainbow Blvd., Kansas City, Kan. LB **$242,115,** two structures, Proj. 8-34-B (1), Douglas and Leavenworth Counties;

Kan.—**J. D. Armstrong,** 1606 Grand St., Ames, Ia. LB, **$298,597,** five structures, Proj. 6-22-B (1), Lyon Co.; LB, **$81,125,** two structures, steel beam, continuous

(Continued on page 147)

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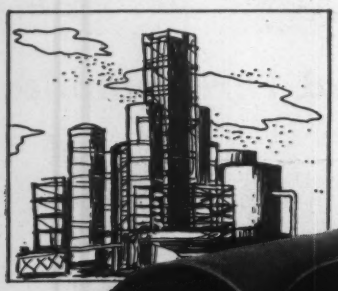

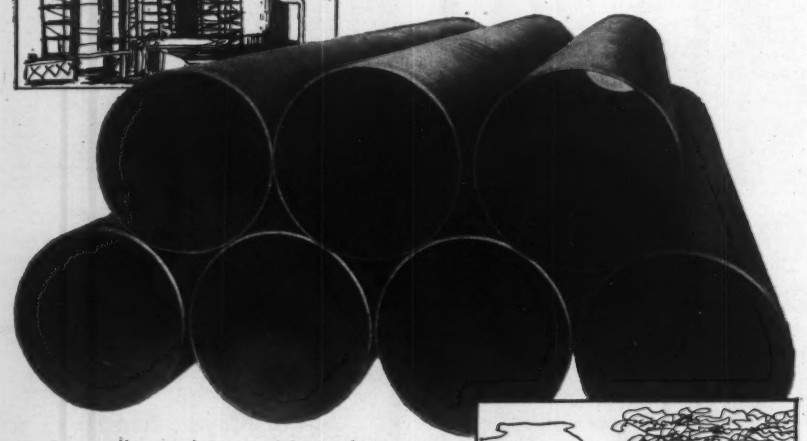

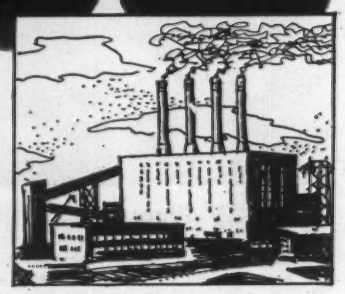

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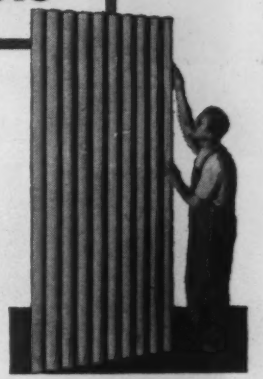

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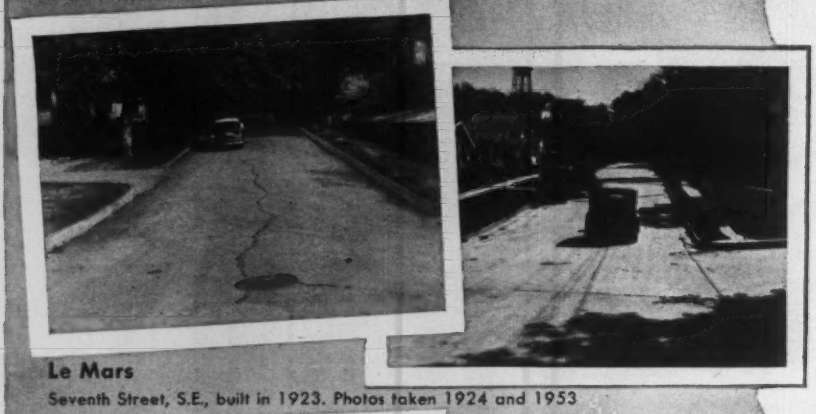
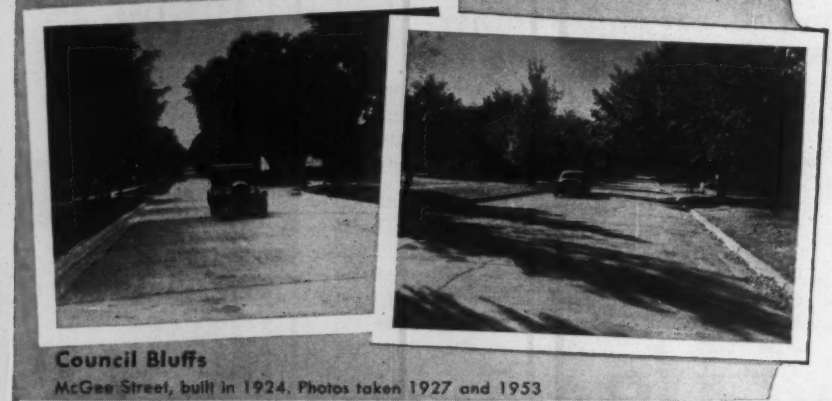
that's the story of Iowa's Concrete Streets

Sioux City
13th Street, built in 1913. Photos taken 1927 and 1953



Le Mars
Seventh Street, S.E., built in 1923. Photos taken 1924 and 1953

Missouri Valley
Superior Street, built in 1922. Photos taken 1922 and 1953



Council Bluffs
McGee Street, built in 1924. Photos taken 1927 and 1953

MANY Iowa motorists and taxpayers have vivid memories of the "Let's Get Iowa out of the Mud" programs of 35 or 40 years ago. Today these same motorists and taxpayers can be proud of the concrete pavements built a generation ago. Many of these fine old pavements have given continuous ***low-annual-cost*** service under weights and volumes of traffic far beyond what they were designed to carry.

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(Continued from page 144)

span, Proj. 6-22-B (2), Lyon Co. Bids Apr. 8. CD 3/28.

▲ **KANSAS**—Kansas Turnpike Auth., 2306 W. 10 St., Topeka,

Kan.—**Amis Constr. Co.**, P. O. Box 1871, Oklahoma City, Okla. CA **$687,973**, grading, drainage type constr. 7.11 mi. Proj. 6-22-E (1), Lyon Co.;

Kan.—**M. W. Watson**, National Bank Bldg., Topeka, Kan. CA **$688,706**, grading, drainage type constr. 9.54 mi. Proj. 6-23-E (1), Lyon, Osage and Wabaunsee Counties. CD 4/5, under LB.

KANSAS—Kansas Turnpike Auth., 2306 W. 10 St., Topeka,

List & Clark Constr. Co., 730 Railway Exchange Bldg., Kansas City, Mo. LB **$531,717**, grading, drainage type constr. 5.04 mi. Proj. 8-34-E (1), Douglas and Leavenworth Counties. Bids Apr. 8. CD 3/28.

▲† **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan. CA **$1,085,296**, storage facilities Smoky Hill Air Force Base, Inv. 23-028-55-60, SALINA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Mar. 28, awarded Mar. 31. CD 4/12, under LB.

† **Bushman Constr. Co.**, 4635 Wyandotte St., Kansas City, Mo. CA **$805,166.** exten. airfield facilities Forbes Air Force Base, Inv. 23-026-55-59, TOPEKA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Mar. 25, awarded Mar. 31. CD 4/12, under LB.

▲ **Utility Contractors, Inc.**, 610 N. Main St., Wichita, Kan. CA **$1,418,557.** Sanitary Sewer No. 23 supplementary to Sanitary Sewer No. 12, WITCHITA, KAN. City, Wichita, Kan. Black & Veatch, 4706 Broadway Kansas City, Mo., engrs. Bids Mar. 29.

† **Eugene Luhr & Co.**, Columbia, Ill., CA **$597,545.** Phase III, Oklahoma City Floodway, Oklahoma City. ENG-34-066-55-83, OKLAHOMA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Mar. 16. CD 3/24, under LB.

H. H. Null Constr. Co., 6103 Kenwood St., Dallas, Tex., LB **$353,490**, Alt. 1; LB **$326,767**, Alt. 2, for Sect. A only;

R. B. Hodgson, Box 1651, Lubbock, Tex., LB **$115,370**, Sect. B only, of 24 and 30 in. water lines, ABILENE, TEX. City, City Hall, Abilene, Tex. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., engrs. Bids Apr. 1.

† **T. C. Bateson Constr. Co.**, Box 7305, Inwood Station, Dallas, Tex., LB **$925,890**, Prop. No. 1; LB **$910,267**, Prop. No. 2; LB **$922,890**, Prop. No. 3; LB **$907,267**, Prop. No. 4, Air National Guard Facilities ENG-41-243-55-87, ELLINGTON AIR FORCE BASE, TEX. Bids Apr. 1, CD 3/15.

Albert Lalonde Co., Sidney, Mont. CA Est. **$460,000.** grade new railway line over continental divide near Butte to bypass Homestake tunnel, 3,440 ft. line change, Silver Bow Co., MONTANA. Northern Pacific Ry. Co., H. R. Peterson, ch. engr., 176 E. 5 St., St. Paul, Minn.

▲ **WYOMING**—State Hy. Comn., Cheyenne,

Wyo.—**Big Horn Constr. Co.**, Sheridan, Wyo., CA, **$328,961**, est. $325,980. base course surf., plant mix surf., sand-grav. seal coat 26.044 mi. Gillette-Broadus road, Wyo. Proj. S-263 (8) and SSNP 4039 Comb., Campbell Co.; CA **$187,688.** base course surf., plant mix surf. course, seal coat 17.654 mi. Medicine Bow-North Road, Proj. S-50 (10), Carbon Co.; CA **$820,235**, base course surf. one culvert 11.331 mi. Sundance-Beulah Rd, IN-25 (4), Crook Co.;

Wyo.—**Woodward Constr. Co.**, Rock Springs, Wyo., CA, **$397,725.** plant mix surf., seal coat 12.96 mi. Green River-Rock Springs Rd., 11.747 mi. Pinedale-Rock Springs Rd. 0.227 mi. Community Park Rd., F-FI-190 (6) F-140 (11) SC-CFM 4041, Sweetwater Co.

Wyo.—**Asbell Bros. Constr. Co.**, Riverton, Wyo., CA, **$253,631**, base course surf., plant mix surf. course, sand-gravel seal coat 4.335 mi. Chugwater-Cheyenne Rd., IN-F-35 (5), Platte Co.;

Wyo.—**Taggart Constr. Co.**, Cody, Wyo., CA **$155,790** plant mix surf. course, seal coat 22.931 mi. Cody-Yellowstone Road, No. 3948, Park Co. Grand total $2,144,029. Bids Apr. 7, awarded Apr. 8. CD 3/30.

† **George A. Rutherford, Inc.**, 915 Hazeldine St. S.E. Albuquerque, N. M., CA **$380,457.** addnl. facilities at Manzano Base, Ordnance Storage Area, Serial No. ENG-29-005-55-52, MANZANO BASE, N. M. CD 12/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Steenberg Constr. Co.**, 1371 Marshall Ave., St. Paul, Minn. CA **$2,500,000.** SHOPPING CENTER containing 30 business outlets Hy. 8 and Lexington Ave., CIRCLE PINES, MINN. Circle-Lex Corp., c/o G. R. Sauers Co., archt., 1255 Lapenteur Ave., W., St. Paul, Minn.

Viking Constr. Co., 5948 Pleasant Ave., Minneapolis, Minn. CA **$594,300.** general contract HOSPITAL addn., FERGUS FALLS, MINN. Lake Region Hospital, P. Hofstad, administrator, Fergus Falls, Minn. CD 3/4, under LB.

Sherbrooke Constr. Co., 6149 Louisiana Ave., St. Louis 11, Mo. Owner Builds. **$750,000.** 153 RESIDENCES on 34 acre tract on Union Rd. just south of Weber Rd. installing water sewers, concrete streets, AFFTON (ST. LOUIS 23 P. O.), MO.

▲ **Gamble Constr. Co.**, 804 Pine St., St. Louis 1, Mo. CA Est. **$1,000,000.** 2 story, 62x321 ft. rein.-con. SERVICE BLDG., Lindbergh Blvd. and Brown Rd., ROBERTSON (ST. LOUIS 21 P. O.), MO. McDonnell Aircraft Corp., Lambert-St. Louis Municipal Airport, Robertson 21, Mo. CD 4/6, under LB.

▲ **Fruin-Colnon Contg.**, 1706 Olive St., St. Louis 3, Mo. CA Est. **$2,250,000.** 1 story, 232x920 ft. combination FACTORY and FOUNDRY, and adjacent 130x200 ft. OFFICE section on 120 acre tract on Hy.

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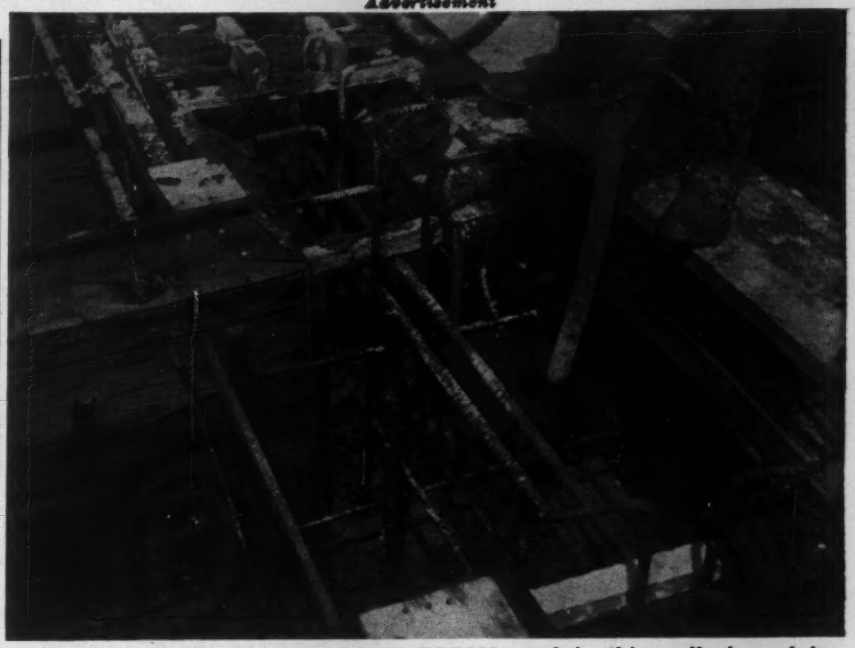

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One of the many ways experienced concrete foremen get maximum benefit from vibration is by planning concrete placement so each new dump is backed into a previous dump. This results in a smooth surface (no rock pockets) with maximum bond and greater strength. In the above photo the workman has just finished vibrating a dump at the center of a box girder intersection. As each succeeding dump is placed he will vibrate from the center outward, working it into concrete previously placed in the side members.

Appearance of sheen on the surface of the concrete gives visual indication that vibration is complete. With the modern high frequency vibrators pioneered by VIBER this requires only about 10 to 30 seconds, depending on the characteristics of the concrete.

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• **Good Forming** and proper vibration are essential where finished appearance is important, as it was on this overpass built by Erickson, Phillips, and Weisberg as part of the East Bay Freeway in Oakland, California. Tight forms made of well-seasoned lumber adequately braced can take full advantage of vibration to produce smooth, rock pocket-free concrete. VIBER'S replaceable rubber tipped vibrators are specially designed to prevent any damage to such forms, which might cause blemishes on the finished concrete surface

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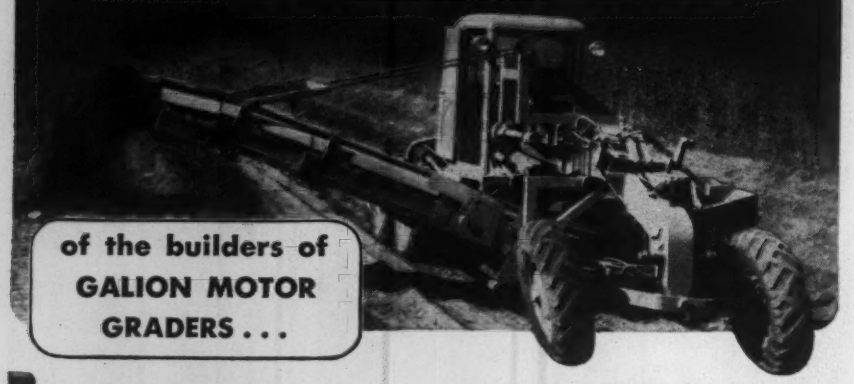

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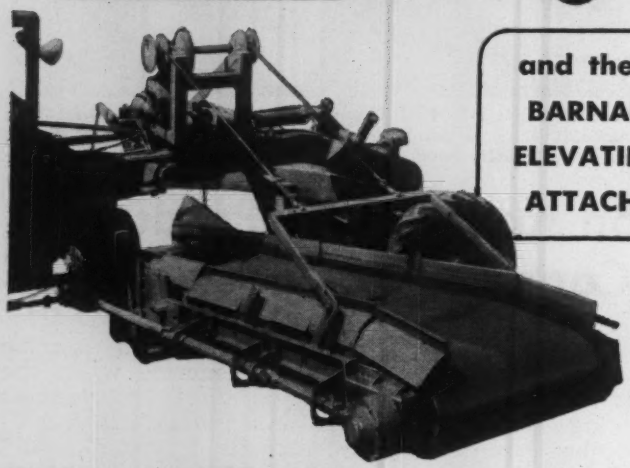

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▲ Murch-Jarvis Constr. Co., 718 Locust St., St. Louis 1, Mo., CA Est. $2,000,000. 3 story, bsmnt., 114x-140 ft., steel, rein.-con., masonry STORE and OFFICE 6 and Locust Sts., ST. LOUIS, MO. F. W. Woolworth Co., 3663 Lindell Blvd., St. Louis 8, MO. CD 3/2.

Multin Realty & Development Co., 8148 Delmar Blvd., University City 24, Mo. Own Forces. Est. $600,000. 65 brick ranch type RESIDENCES in Westover Lane No. 3 subdivision at 8000 Olive Street Rd., UNIVERSITY CITY (ST. LOUIS P.O.), MO. Robert G. McMahon, 8147 Delmar Blvd., University City 24, Mo., archt.

M. K. Eby Constr. Co., Inc., 610 N. Main St., Wichita, Kan. LB $919,980. HOSPITAL addn., WICHITA, KAN. Wesley Hospital, 550 N. Hillside St., Wichita, Kan. Bids Mar. 25. CD 3/16.

▲ T. B. Hubbard Constr. Co., Inc., Box 1652, Houston, Tex., LB $1,398,000. SENIOR HIGH SCHOOL ALDINE, TEX. Aldine Independent School Dist., Adline Tex. Bids Apr. 5. CD 3/16.

Archie C. Fitzgerald, Box 101, Austin, Tex., LB $503,-000, est. $350,000. RECEIVING and GYMNASIUM for State School, AUSTIN, TEX. Bd. for Texas State Hospitals & Special Schools, P. O. Box S, Capitol Station, Austin, Tex., Bids Apr. 6. CD 3/22.

J. M. Odom, Box 774, Austin, Tex., LB $498,823. 100 room rein.-con. frame, face brick Commodore Perry HOTEL addn., swimming pool, AUSTIN, TEX. East Side Development Co., Perry-Brooks Bldg., Austin, Tex. Bids Apr. 5. CD 3/9.

McDade & McDade, 1743 Esperson St., Houston, Tex., CA $364,415, 33 DWELLINGS; CA $378,115, 36 DWELLINGS "Sharpstown", BELLAIRE, TEX. M. P. Moore, 1743 Esperson St., Houston Tex. CD 1/21.

W. B. Abbott, Jr., Box 585, Lubbock, Tex., CA $538,-261. brick, concrete steel HIGH SCHOOL addn., and ELEMENTARY SCHOOL, BROWNFIELD, TEX. Brownfield Independent School Dist., Brownfield, Tex. Bids Mar. 29. CD 4/6, under LB.

Rambo Constr. Co., Box 11245, Fort Worth, Tex., CA $597,567. masonry, brick, hollow tile, concrete ADMINISTRATION BLDG., DENTON, TEX. North Texas State College, Denton, Tex. Bids Mar. 31. CD 4/8, under LB.

▲ W. E. Krumnow, 78 Turner St., Houston, Tex., CA $357,000, 7 DWELLINGS; CA $379,115, 11 DWELLINGS;

H. A. Morris, 510 New Haven Dr., Houston, Tex., CA $351,225, 14 DWELLINGS, HOUSTON TEX. Grand total $1,087,340. Westchester Development Co., 3829 Villanova St., Houston, Tex. CD 3/21.

Lewis O. Tyra & Dan McCrary, 5519 Lawndale St., Houston, Tex. Own Forces. $359,185, No. 7, 28 DWELLINGS, $350,000, No. 9, 25 DWELLINGS, near HOUSTON, TEX. CD 1/26.

Tidmore Constr. Co. 2201 34th St., Lubbock, Tex., CA $425,000, 5 story, bsmnt. OFFICE, LUBBOCK, TEX. W. B. Rushing, Lubbock, Tex. CD 3/30.

▲ J. Emil Anderson & Son, 1809 W. Balmoral St., Chicago, Ill., CA Approx. $6,000,000. PLANT and facilities for mfr. pipe line and production valves, plant proper will cover 10-acres, MISSOURI CITY, TEX. Amtex Corp., c/o Thorlief B. Jorgensen, engr. 4215 Graustark St., Houston, Tex. WKM Manufacturing Co., 221 Roberts St., Houston, Tex., subsidiary of ACF Industries, lessee.

Bellaire Housing Corp., c/o Lloyd A. Denton, Milam Bldg. San Antonio, Tex., Own Forces, $388,125, 26 DWELLINGS; $353,135, 23 DWELLINGS, SAN ANTONIO, TEX. CD 1/19.

Peachey Constr. Co., 1220 Polk St., Houston, Tex. CA $370,000. 35 DWELLINGS, SPRING BRANCH, TEX. Truett Peachey, Developer, 1220 Polk St., Houston, Tex. CD 4/6.

▲ Percy Andrews, J. O. Daughtry & Assocs., Tyler, Tex. Force Account. $375,000, 36 DWELLINGS; $355,-000, 25 DWELLINGS; $365,000, 32 DWELLINGS; $350,000, 30 DWELLINGS, TYER TEX. Grand total $1,445,000. CD 3/17.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 4 California

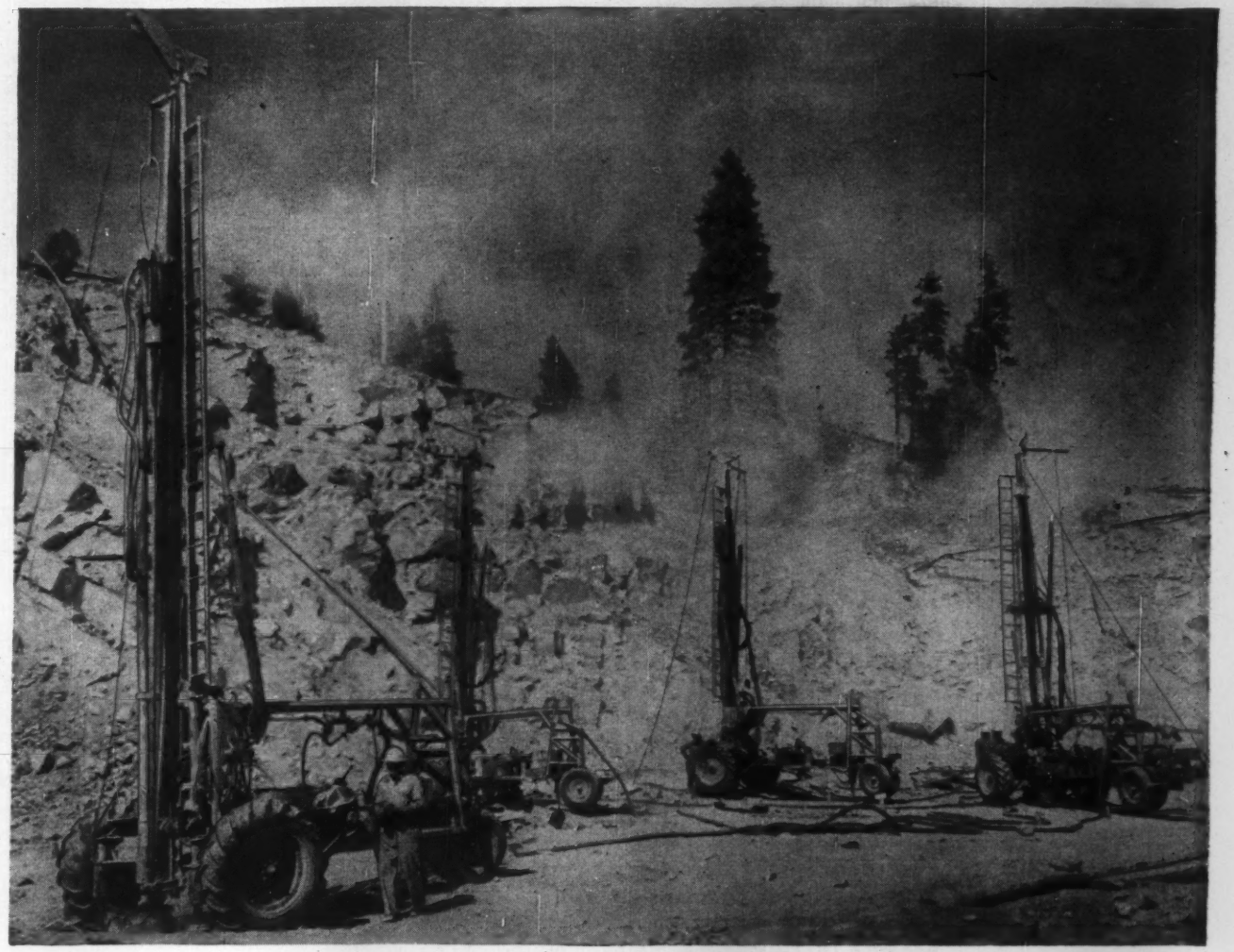
BIDS ASKED—BUILDINGS

▲ Calif., Los Angeles—CLINICAL and SURGICAL—BA 5/3 Veterans Admin., Munitions Bldg., Wash., D. C. clinical and surgical bldg., Wadsworth Hospital, Veterans Administration Center. $8,000,000. Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, archts.-engrs. CD 12/1.

▲ Calif., Pomona—HOSPITAL —BA 5/11—State of California, 1120 N. St., Sacramento, Pacific State Hospital annex, existing facilities alterations, $1,500,-000. Plans deposit $100.

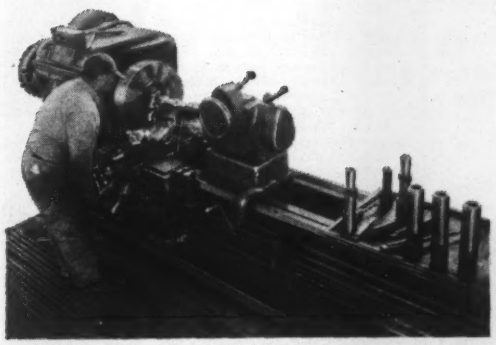
Calif., Petaluma—HOSPITAL—BA 5/16—Petaluma District Hospital, Petaluma, 50-bed hospital. $850,000. Stone & Mulloy, 619 California St., San Francisco, archts. CD 6/16.

(Continued on page 150)



Crucible hollow drill steel at work on site of new Cherry Valley Dam.

A BIG BITE... 1½-million yards of hard granite



Machining a shank adaptor of Crucible Max-el 3½ alloy steel, for use on Joy *Challenger* drill.

That's the amount of hard rock the Guy F. Atkinson Company has now drilled through in constructing the new Cherry Valley Dam near Sonora, California.

For this tough job, two-inch round Crucible *Crusca* hollow drill steel is being used in eight big Joy *Challenger* drills.

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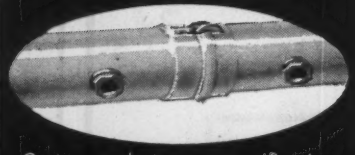

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(Continued from page 148)

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Howard S. Wright & Co.,** 414 Pontius St., Seattle, Wash., CA, $1,000,000. PULP MILL addn., ANACORTES, WASH. Coos Bay Pulp Corp., Anacortes, Wash. CD 2/25.

† **Ostruske**—Murphy Co., 2907 A St., Tacoma, Wash., CA, $457,861, est. $484,636, primary treatment sewage plant for 70,000 population, ENG-45-108-55-164, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 8. CD 3/7.

Lord Bros., 9233 N. Calvert St., Portland Ore., CA $748,148. Multnomah Blvd. storm and sanitary sewer, PORTLAND, ORE. City, City Hall, Portland, Ore. Bids Oct. 14, 1953, awarded Apr. 4, 1955. CD 10/20/53, under LB.

† **CALIFORNIA**—Bureau P. Rds., Dpt. Commerce, Old Mint Bldg., 5 and Mission Sts., San Francisco,

J. Ira McNutt Constr. Co., P. O. Box 296, Springfield, Ore., CA, $459,102, road constr. Proj. F H 3-E Trinity River, Six Rivers National Forest D7-H1-3L, Humboldt Co. Bids Mar. 10, awarded Mar. 15. CD 2/28.

▲ **Utah Constr. Co.,** 100 Bush St., San Francisco, Calif., and **Bates & Rogers Constr. Corp.,** 600 W. Jackson St., Chicago, Ill., CA, $35,000,000. driving 24 ft. diam. tunnel, 6¾ mi. for Poe hydro-electric project on Feather River, CALIFORNIA. Pacific Gas & Electric Co., 445 Sutter St., San Francisco, Calif. CD 11/13/53.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

MacDonald, Young & Nelson, 351 California St., San Francisco, and Morrisen-Knudsen Co., Inc., 74 New Montgomery St., San Francisco, Calif., CA $5,213,162, separation structure, roadwork, etc. between San Francisco-Oakland Bay Bridge at 4 St. and Main St., San Francisco Co. Bids Mar 2, awarded Mar. 22. CD 3/17, under LB.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Mercer, Fraser Co. & Mercer, Fraser Gas Co., Inc., 2 and Commercial Sts., Eureka, Calif., CA, $569,274, plant mix surf. 12.1 mi. between 0.4 mi. south of Crescent City and Oregon State Line, Del Norte Co. Bids Mar. 2, awarded Apr. 1. CD 3/17, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

J. A. Thompson & J. A. Thompson & Son, J. A. Thompson & Son, Inc., P. O. Box 518, Los Angeles, Calif., CA, $1,328,738, grading, paving, undercrossing 1.2 mi. between Waterford St. and Casiano Rd., Los Angeles Co. Bids Feb. 17, awarded Mar. 8. CD 3/8, under LB.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Calif.—**L. C. Smith Co.,** First and Railroad Aves., San Mateo, Calif., LB, $779,137, grading, paving and bridge near Willow Road, San Mateo Co.;

Calif.—**Fredrickson & Watson Co.,** 873 81 Ave., Oakland, Calif., LB, $555,355, grading, paving 4.9 mi. between Deb's Place and Summit Hatchet Mountain, Shasta Co. Bids Apr. 6. CD 3/21.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Calif.—**Clements & Co.,** P. O. Box 697, Centerville, Calif., CA, $678,174, graded road, plant mix surf. 11.7 mi. between Butte Co. Line and Los Molinos, Tehama Co.;

Calif.—**M. W. Brown & R. E. Hertel,** P. O. Box 827, Redding, Calif., CA, $197,029, graded roadbed, place road-mix surf. on cement treated base, steel bridge 1 mi. between Graeagle and Route 21, Plumas Co. Bids Mar 9, awarded Apr. 1. CD 2/16.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Calif.—**C. K. Moseman,** 727 Barron Ave., Redwood City, Calif., CA, $1,103,629. grading, plant mix surf., welded steel bridge, etc. 2.7 mi. between Canal St. in King City and Salinas River, Monterey Co.;

Calif.—**Mercer, Fraser Co. & Mercer, Fraser Gas Co., Inc.,** 2 and Commercial Sts., Eureka, Calif., CA, $613,771, plant mix surf. 5.3 mi. between Eureka and Gannon Slough, Humboldt Co.;

Calif.—**Stolte, Inc. & Gallagher & Burke, Inc.,** 8451 San Leandro St., Oakland, Calif., CA, $1,173,108, grading, c. conc. paving, rein.-con. bridge 1.3 mi. Pleasant Hills Rd., Contra Costa Co.;

Calif.—**Granite Constr. Co.,** P.O. Box 900, Watsonville, Calif., CA, $418,268, grading, plant mix surf., etc., 2.4 mi. between Laurel Dell Lake and Tule Lake, Lake Co. Grand total $3,308,776. Bids Mar. 30, awarded Apr. 1. CD 3/17.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Fredrickson & Watson Constr. Co., 873 31 Ave., Oakland, Calif., CA, $531,606. grading, surf., overcrossing bridge 2.2 mi. between Route 5 at Dublin and 0.2 mi. north of Contra Costa Co. Line, Alameda and Contra Costa Counties. Bids Mar. 23, awarded Apr. 1. CD 3/10.

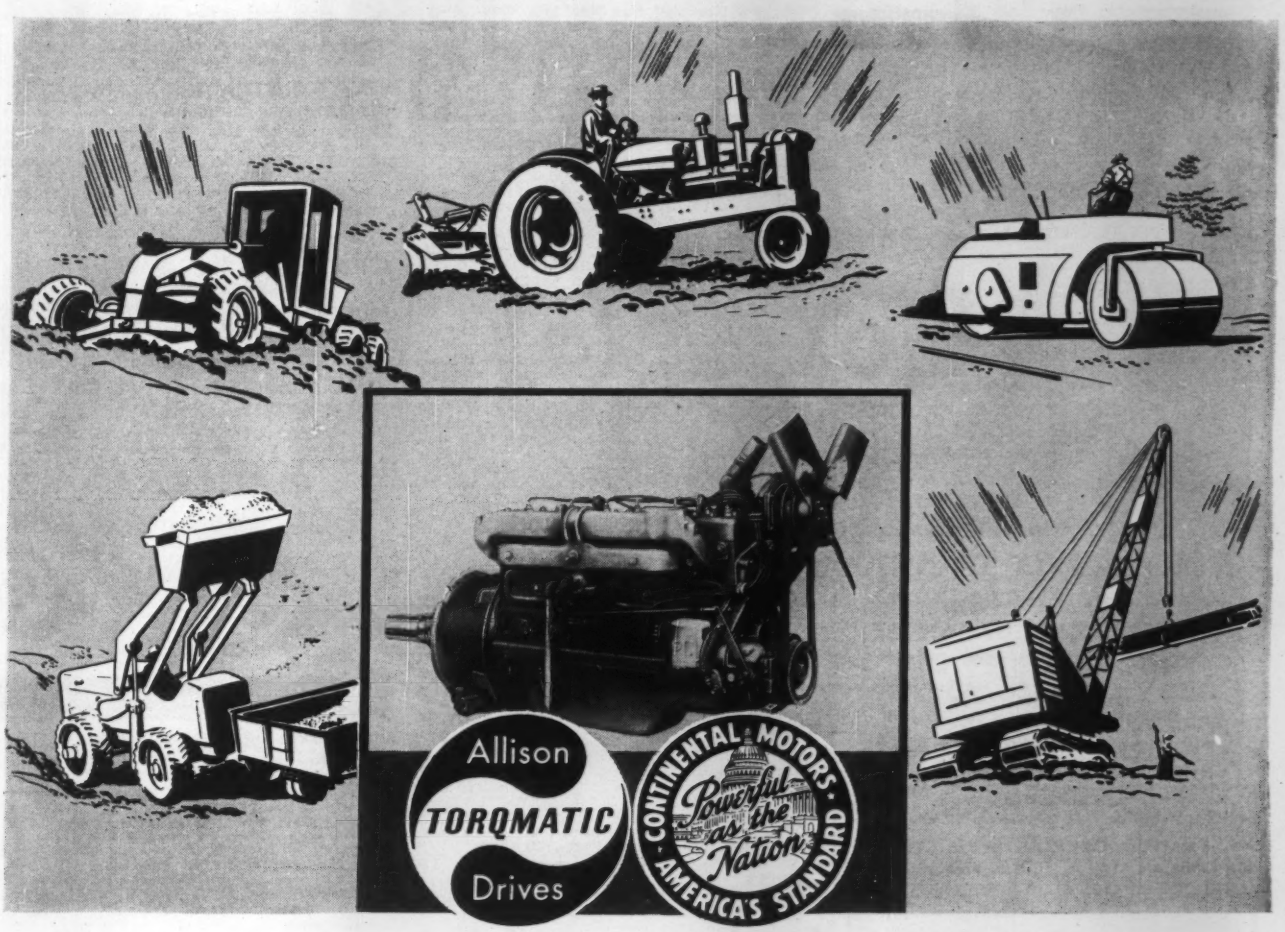
CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

John F. Blademore, 1704 N. Rosemead Blvd., El Monte, Calif., CA, $784,362. plant-mix surf. seal coat, 1.9 mi. between Painted Cave Road, about 6 mi. north of Santa Barbara City limit and San Marcos Pass, Santa Barbara Co. Bids Mar. 2, awarded Mar. 17. CD 2/8.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Schroeder & Co., Box 308, Sun Valley, Calif., CA, $611,517, grading, plant mixed on cement treated surf. 4.5 mi. between Tujunga Canyon Boulevard and Cypress Dr. on Foothill Boulevard, Los Angeles Co. Bids Mar. 17, awarded Apr. 1. CD 2/28.

(Continued on page 152)



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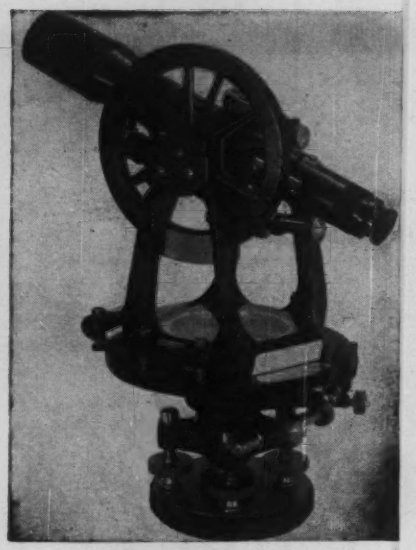

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(Continued from page 150)

▲ CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Calif.—Parish Bros., Inc. & Parish Bros. & Carl N. Swenson Co., Inc., P. O. Box 6, Benicia, Calif., CA, $2,138,969, c. conc., plant mix surf., 3 rein.-conc. bridges, widn. 1 bridge at Railroad Ave. Undercrossing, Roblar Ave. Undercrossing, Route 1/104 separation and at Copeland Creek, between 3 mi. north of Cotati at Wilfred and existing Route 1 at Denman, Sonoma Co.;

Calif.—Basich Bros. Constr. Co. and R. L. Basich & N. L. Basich, 1148 N. Gabriel Blvd., South San Gabriel, Calif., CA, $198,184, roadbed, plant mix surf. 6.3 mi. between 2 mi. north of Ricardo and Little Dixie Wash., Kern Co.;

Calif.—John Delphia, Box 607, Patterson, Calif., CA, $358,595, graded roadbed 0.8 mi. between 0.1 mi. north and 0.7 mi. south of San Francisco-San Mateo Co. line, San Francisco and San Mateo Counties. Grand total $2,695,748. Bids Mar 16, awarded Mar. 25. CD 2/28.

† Johnson, Drake & Piper, 909 San Leandro St., Oakland, Calif., LB, $457,852, fish hatchery at Nimbus Damon American River near Sacramento, Spec. 200C-269, CALIFORNIA Bureau Reclamation, Dpt. Interior, Folsom, Calif. Bids Mar. 24. CD 3/1.

† Clarence Ward Constr., 4623 E. Harvey Ave., Fresno, Calif., CA, $115,703, wing headquarters. Bids Mar. 25, CD 3/11;

Stolte, Inc., 8451 San Leandro St., Oakland, Calif., CA, $184,097, technical training bldg., Bids Mar. 22, CD 2/28; CA $426,083, A.D.C. facilities, incl. access apron operational apron, readiness hangar, utilities, CASTLE AIR FORCE BASE, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Feb. 15. CD 2/2.

† Rogers Constr. Co., 3669 California St., San Diego, Calif., LB, $860,995, training and advance base gear facilities, Naval Air Station, MIRAMAR, CALIF. Dpt. Navy, 11th Dist., San Diego, Calif. Bids Apr. 7. CD 3/16.

Fred J. Early Jr. Co., Inc., 22138 S. Vermont Ave., Torrance, Calif., CA $428,760, sewage treatment plant, OXNARD, CALIF. City, City Hall, Oxnard, Calif. Bids Apr. 5. CD 2/23.

BUILDINGS

LOW BIDS AND CONTRACTS

Gordon E. Faratte, 546 Fifth St., Gilroy, Calif., LB, $467,276, SCHOOL addns., GILROY CALIF. Gilroy Union High School Dist., 263 N. Church St., Gilroy, Calif. L. F. Richards, 1033 Jackson St., Santa Clara, Calif., archt., O. B. Christensen, 725 Kifer Rd., Santa Clara, Calif. structural engr. CD 10/7.

J. D. Huizenga, P.O. Box 243, Seaside, Calif., LB, $415,500 SCHOOL, Seaside, MONTEREY, CALIF. Monterey City School Dist., Box 1031, Monterey, Calif. Awarded Apr. 8. CD 8/4.

▲ B. O. Larsen, 1340 "E" St., San Diego, Calif., CA, $1,559,726, JUNIOR COLLEGE and VOCATIONAL SCHOOL, SAN DIEGO, CALIF. San Diego Unified School Dist., 825 Union Ave., San Diego, Calif. Awarded Apr. 5. CD 3/24, under LB.

† M. H. Golden Constr. Co., 3485 Noell Ave., San Diego, Calif., LB, $824,000. Corpsmen's BARRACKS, NOY 85188, Spec. 44763, SAN DIEGO, CALIF. Dpt. Navy, San Diego, Calif. Bids Apr. 8. CD 3/7.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 27 British Columbia

BIDS ASKED—BUILDINGS

▲ Ont., Dryden—PLANT EXPANSION—BA 4/25—Dryden Paper Co. Ltd., Dryden, (selected list of bidders), paper plant expansion. Over $1,000,000. Anglo-Canadian Pulp & Paper Mills Ltd., 10 Blvd. des Capacins, Quebec City, Que., engrs. CD 11/5.

B. C., Vancouver—HOSPITAL—BA 4/27—Mount St. Joseph's Hospital, Prince Edward St., 5 story, rein.-con. hospital addn., 3080 Prince Edward Ave. $500,000. Plans deposit $50. Gardiner, Thornton & Partners, 1520 Albernis St., archts. CD 6/17/53.

Man., Portage La Prairie—HOSPITAL—BA 4/27—Portage General Hospital Bd., 80-bed cottage type hospital, present hospital addn. $750,000. Green, Blankstein, Russell & Assocs., 222 Osborne St. N., Winnipeg, archts. CD 12/20.

▲ Ont., Toronto—BUS GARAGE—BA 5/4—Toronto Transit Comn., 35 Yonge St., 1 story, 240x417 ft. rein.-con., structural steel bus garage, Danforth and Birchmount Rd. $1,250,000. Plans deposit $100. R. P. Allsop & Assocs. Ltd., 290 Davenport Rd., engrs.

▲ Ont., Toronto—CANCER CLINIC—BA 5/5—Ontario Cancer Institute, 45 St. George St., Toronto, 7 story bsmnt., 72x160 and 56x450 ft. superstructure for cancer clinic, Wellesley and Sherbourne Sts., $4,000,000. Wallace, Carruthers & Assocs. Ltd., 35 Isabella St., engrs. Allward & Gouinlock, 57 Bloor St. W., archts. CD 2/8/54.

B. C., Richmond—SCHOOL—BA 5/9—School District No. 38, Richmond, 1 story, frame high school, Steveston, $500,000. Plans deposit $50. K. J. Sandbrook, 615 Columbia St., New Westminster, archt. CD 3/10/54.

▲ Ont., Ottawa—POLICE—BA 5/24—City, City Hall, police bldg., Daly Ave. and Waller St. $1,500,000. L. W. Pillar, c/o owner, engr. CD 11/29.

Que., Lachine—POST OFFICE—BA 5/25—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. post office, 2150 St. Joseph St. $450,000. Plans deposit $150. E. A. Gardner, c/o owner, ch. archt. CD 3/24/54.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Matthews Concrete Ltd., 459 Princess Ave., London, Ont., CA $569,108, storm sewers, SARNIA, ONT. City, City Hall, Sarnia, Ont. Bids Mar. 21, awarded Apr. 5. CD 3/30, under LB.

S. D. Miller & Sons, 6999 Cotes des Neiges Rd., Montreal, Que., LB, $461,845, Contract 44, 36 in. feeder main on Bellechasse, MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Apr. 4. CD 3/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Poole Constr. Co. Ltd., 2402 2 A St. S.E., Calgary, Alta., CA $3,021,572, 10 story above grade, 2 below grade OFFICE, 7 Ave and 2 St. W., CALGARY, ALTA. Hudsons Bay Oil & Gas Co. Ltd., 534A 8th Ave. W., Calgary, Alta. Bids Mar. 31, awarded Apr. 4. CD 2/28.

▲ Burns & Dutton Concrete & Constr. Co. Ltd., 9004 125 Ave., Edmonton, Alta., CA $1,420,000 general contract;

Canadian Comstock Ltd., Wilkin Bldg., Edmonton, Alta., CA, $430,000. plumbing, heating and ventilating for new SCHOOL for DEAF, EDMONTON, ALTA. Alberta Govt., Parliament Bldgs., Edmonton, Alta. Bids Mar. 25, awarded Apr. 4. CD 2/24.

Metron Development Ltd., 877 Lake Shore Rd., Toronto, Ont. Owner Builds. $432,000, 7 story, bsmnt. APARTMENT, Davenport Rd. east of Bathurst St., TORONTO, ONT. CD 4/13.

▲ Eastern Constr. Co., Box 96, Walkerville, Ont., CA, $3,000,000, 3 story MILL, 3 story FERMENTING BLDG. and 5 story STILL BLDG. at distillery expansion, WINDSOR, ONT. Hiram Walker & Sons Ltd., 2067 Sandwich St. E., Windsor, Ont. Bids Mar. 31, awarded Apr. 5. CD 3/10.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

▲† Alaska—AIR BASE CONSTR.—BA 5/18—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. 50,000 sq. ft. rein.-con., masonry field house, incl. 49x75 ft. swimming pool, offices, equipment and locker rooms, etc., Elmendorf Air Force Base; three maintenance hangars, 1 story, approx 148x472 ft. structural steel frame constr., incl. outside utilities one on Elmendorf and two on Ladd.

1 story, 76x79 ft. rein.-con., masonry armament and electronics shop at Elmendorf.

1 story, 10x20 ft. masonry solvent storage bldg., incl. outside electrical distr. sys. at Elmendorf.

communication duct line sys., incl. installation of 1,400 ft. double 4 in. ducts and 3,375 ft. quadruple 4-in. ducts, six manholes, 575 sq. yds. concrete sidewalks, 570 sq. yd. b. conc. pavement at Elmendorf.

imprvs. to housing and barracks under construction incl. furnishing, installing locksets on 974 family housing units; furnish, install ventilation fans and louvers in addn. to raising shower pans and waterproofing total of 54 shower stalls in nine 200-man barracks bldgs., at Elmendorf Air Force Base, Inv. 55-52. $3,000,000. Plans deposit $100. CD 11/25/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† ALASKA—The Alaska Railroad, Dpt. Interior, Anchorage,

Mannix International, Ltd., Juneau, Alaska, CA $400,000, 100,000 cu. yd. crushed gravel ballast at Spencer and 200,000 cu. yd. at Broad Pass for roadbed imprvs.

J. A. Troxell, Bellevue, Wash., CA $490,310, hydroelectric dam, penstock and power house, PETERSBURG, ALASKA. Town, Town Hall, Petersburg, Alaska. Bids Mar. 19 rejected, LB $624,000. CD 3/28, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

† Macri-Montgomery Co., Anchorage, Alaska, CA $552,900, THEATER, Spec. 37588 and SHOP, Spec. 37592, at Naval Base, KODIAK, ALASKA. P. Wks. Office, 17th Naval Dist., Kodiak, Alaska. Bids Mar. 25.

PUERTO RICO

BIDS ASKED—HEAVY CONSTRUCTION

† Puerto Rico, Mayaguez—TEST CENTER CONSTR.—BA About 5/24—U. S. Eng., P. O. Box 4970, Jacksonville, Fla., AN/FPS-8 facility (FY-55), and transmitter bldg. (FY-53) Auxiliary No. 9. Air Force Missile Test Center, ENG-08-123-55-92.

AMERICANS ABROAD

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Merritt-Chapman & Scott Corp. and B & M Co., 260 Madison Ave., New York, N. Y., LB Est. $5,000,000. 475 mi. pipe line from Rota to Zaragoza in connection with Air Force Bases, for Bureau Yards & Docks, SPAIN. Brown-Raymond-Walsh, 122 E. 42 St., New York, N. Y.

(Proposal Advertisement see pp. 170 to 174)

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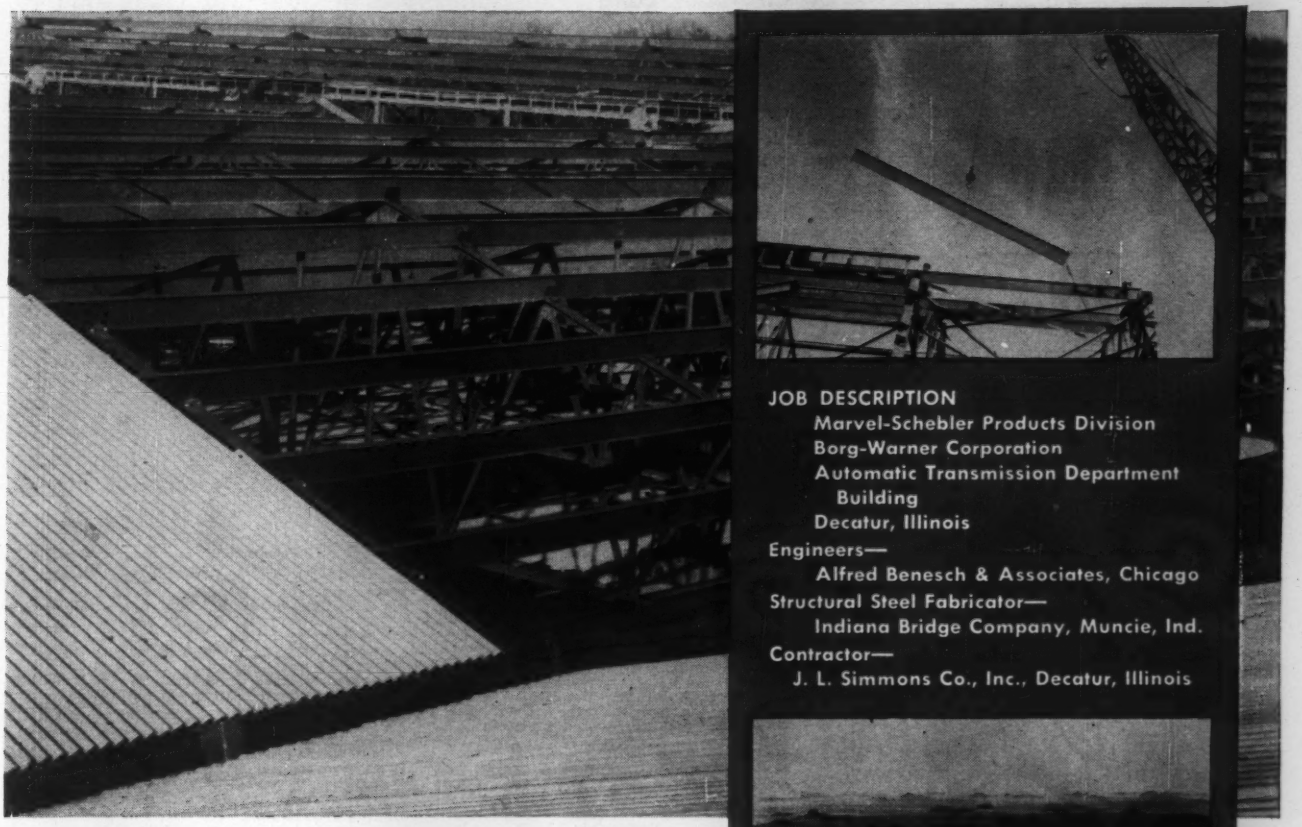


JOB DESCRIPTION
Marvel-Schebler Products Division
Borg-Warner Corporation
Automatic Transmission Department Building
Decatur, Illinois
Engineers—
Alfred Benesch & Associates, Chicago
Structural Steel Fabricator—
Indiana Bridge Company, Muncie, Ind.
Contractor—
J. L. Simmons Co., Inc., Decatur, Illinois

2400 tons of steel structurals, including over 500 tons of J&L Junior Beams, in 75 days . . . that was the "unusual" erection schedule laid down for the new automatic transmission building of Borg-Warner Corporation's Marvel-Schebler Products Division. And the schedule was met with a few days to spare!

The men on the job give lightweight Junior Beam roof purlins a big share of the credit for this outstanding accomplishment. Here are just some of their reports.

"The time for delivery of steel . . . was the essence of the contract. We chose J&L Junior Beams because of their availability, simple fabrication and ease of erection."

H. E. WRAY, Assistant General Manager
INDIANA BRIDGE COMPANY

"We could never have met the schedule that was laid down without these J&L Junior Beams. They have a wider seating area and double footings which gave our workmen a safer, faster area of moving around aloft. If we had used the usual channels, we would have had to slow down for safety's sake. We would have had foot room on only one side of the bottom of the channels, compared with a place on either side for a man to get foot support on the beams."

CECIL STODGHILL, Construction Superintendent
INDIANA BRIDGE COMPANY

Take a tip from the men that are using them, J&L lightweight Junior Beams can help you cut building costs. Experience shows that J&L Junior Beams are the most economical hot rolled purlin sections available. They're adaptable, easy to install, rigid and vibration resistant.

Write today for more information on this modern lightweight J&L structural.

Jones & Laughlin Steel Corporation
428 Gateway Center, Pittsburgh 30, Pa.

☐ Please send me a free copy of your booklet on J&L Junior Beams.
☐ Please send me comparative cost figures on purlin sections.

Name_____
Company_____
Address_____
_____

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

J&L STEEL

JUNIOR BEAMS ARE READILY AVAILABLE FOR PROMPT DELIVERY

TAKE TIME OUT

Cancer strikes 1 in every 4 Americans. It strikes with vicious swiftness. Too often it is discovered — too late.

To protect yourself and your family, have a thorough medical examination every single year without fail. Six months after such an examination, every woman over 35 should return for a pelvic checkup. Every man over 45 should have a chest X-ray twice each year. *Many cancers can be conquered if caught in time!*

STRIKE BACK AT CANCER... MAN'S CRUELEST ENEMY

Give to
AMERICAN CANCER SOCIETY

St. Lawrence Long Sault Dam Prices Seesaw Into Tight Bidding

Back of that sensational cement bid that alone swung the St. Lawrence Power, Long Sault dam contract to the Walsh-Perini-Morrison-Knudsen-Kiewit-Utah joint venture at $26-million (ENR Apr. 7, p. 27) are other differences of opinion on unit prices.

In the excavation group alone No. 1 and No. 2 bids see-sawed on prices like this: common excavation, dry—No. 1 $0.80/cy, No. 2 $0.372; wet—No. 1, $0.80; No. 2, $1.20. But No. 1 was high on total excavation by $1.827-million. On placing dam concrete No. 1 bid $12.10/cy, No. 2 $14.75; on diversion tunnel wall concrete No. 1 bid $26.00/cy, No. 2 $21.90. No. 1 was low on total concrete by $1.334-million.

Wage rates set include laborers, unskilled $1.90, skilled $2.025; journeymen carpenters, heavy construction $3.025, dock builders $2.975, electricians $3.15, truck drivers $1.80, iron workers, reinforcing and structural $3.30.

This St. Lawrence Power Project structure, under N. Y. State's Power Authority, will be a concrete gravity, crescent-shape dam 110 ft high above foundation and will raise the water level about 90 ft above river bottom. The 2,780-ft crest includes an 1,800-ft. overflow spillway and south and north abutments 180 ft and 800 ft. The contractor will install 30 spillway vertical lift gates, 50x20-ft. Six hoists will regulate 18 gates and two traveling gantry cranes the other gates.

1C	Walsh Const. Co., B Perini & Sons, Inc., Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co., Utah Const. Co., N. Y., N. Y., alternate incl natural cement	$25,972,033A
	base bid using portland cement only	26,018,923B
2	Henry J. Kaiser Co., Raymond Conc. Pile Co., Brown & Root, Inc., Mannix Ltd., Pacific Bridge Co., General Const Co., The Shea Co., Corbetta Const. Co., Miron et Freres Ltd.,	25,998,222A
	Oakland, Calif	25,998,222B
8	Grafe-Callahan Const. Co., The Ralph M. Parsons Co., Tecon Corp., Gunther & Shirley Co., Los Angeles, Calif	34,363,205A
		34,311,105B

Bids: 3-24-55 Items	Unit	Quantity	Unit Prices 1C	 2
Cofferdams				
Diversion & care river	ls		$350,000	$670,000
Unwatering, stage I	ls		40,000	147,000
Exc, cut F & sc channel common, dry	cy	4,880,000	0.80	0.372
common, wet	cy	1,130,000	0.80	1.20
rock, dry	cy	16,000	3.25	1.45
rock, wet	cy	4,000	14.00	9.10
Install plug, cut C	ls		25,000	16,000
Rem cofferdams A & B	ls		350,000	260,000
Install cofferdam E	ls		550,000	690,000
Cofferdams DD & DU:				
exc, strip riv bottom	cy	11,000	2.50	9.30
rock fill, shore fills	cy	11,500	1.35	0.63
fill, shore fills	cy	12,000	1.00	0.49
steel sheet piling, plug in cut C	t	3,400	130.00	51.00
cell fill	cy	94,000	1.60	0.90
sand & gravel blanket	cy	15,000	1.60	0.50
riprap	cy	21,000	2.25	1.15
derrick stone	t	6,900	4.50	4.00
Timber crib cofferdam closure, cofferdam DD	ls		35,000	43,000
Init unwatering stage II	ls		35,000	43,000
Unwatering, stage II	ls		80,000	146,000
Divrn tun gates, guide, dogging devices, I	t	1,000	40.00	57.00
Divrn sluice gt twrs, I	t	353	110.00	71.00
Rem bridge, cut C	ls		2,000	11,000
upr divern sluice twr	ls		2,500	10,000
cofferdam DD	ls		234,090	260,000
E	ls		240,000	140,000
plug in cut C	ls		30,000	20,000
Excavation				
Exc, common for dam	cy	309,000	1.00	0.70
rock, for dam	cy	148,000	3.60	3.10
common, access rds & embankmts	cy	47,000	1.10	0.70
stripping, borrow	cy	20,000	0.60	0.42
common, borrow	cy	150,000	0.60	0.43
Final fndn cle nup	sy	85,500	4.00	5.70
Drill line holes	lf	4,000	0.40	1.45
Grouting				
Grt holes in conc	lf	2,500	2.90	3.00
Drill & grout holes, overburden	lf	10,000	3.40	4.30
Core drill AX holes 0-75'	lf	7,000	2.25	4.30
75-200'	lf	5,000	2.40	4.30

Bids: 3-24-55 Items	Unit	Quantity	Unit Prices 1C	 2
Drill grout holes:				
w/percussn drills 0-25'	lf	14,000	0.65	0.80
w/rotary drills 0-75'	lf	35,000	1.60	2.47
75-150'	lf	13,000	1.75	2.47
Met P & fitg for grt & drainage, f&p	lb	86,500	0.30	0.38
Drill drainage holes	lf	9,200	4.20	5.40
Split sewer pipe drains	lf	20,000	6.50	6.20
Pressure grting fndns	cf	45,000	1.60	2.90
Connections to grt holes	ea	4,000	7.30	12.30
Met tubing & fitgs for grting tunnel plugs & stg III sluicewy pours	lb	50,000	0.45	0.41
Pr grt divern tun plug & stg III sluicewy pours	cf	2,900	7.30	5.80
Dam embankments				
Earth fill	cy	391,000	0.30	0.26
Special compactn earth fl	cy	15,000	1.40	4.50
Drainage layer	cy	7,300	2.75	1.40
Filter layer bet rock & earth fill	cy	15,600	2.75	1.55
Rock fill	cy	16,700	1.75	1.40
Cr rock or grav blanket	cy	1,500	6.00	2.10
Riprap	cy	24,400	3.75	2.25
Embankment, access rds	cy	37,000	0.30	0.32
Road				
Bank run grav fndn crse	cy	15,400	3.00	3.70
Filled stone base	cy	2,400	6.00	12.30
Bit mac base crse	t	3,400	5.50	7.70
Bit matl penetr method	gal	32,000	0.21	0.20
Asph conc, plant mix	t	2,900	10.00	13.60
Hway guard rail, f&e	lf	9,600	2.50	2.90
Topsoil, seeded	ac	10	1,000	400.00
Seeding	ac	6	400.00	370.00
RCCP, f&i, 36"	lf	50	36.00	23.80
24"	lf	150	18.00	14.00
Concrete				
Portland cement	bbl	540,000	4.35	4.30
Alternate portland cmt	bbl	435,800	4.35	4.30
Alternate natural cmt	bbl	104,200	3.90	4.30
Reinf bars	lb	9,208,700	0.13	0.10
Conc, dam	cy	357,000	12.10	14.75
divern gte guide piers	cy	3,000	27.00	27.10
divern sluice piers	cy	24,200	16.50	20.00
stage III pier nosings	cy	1,500	32.50	28.40
stge III divern sluice spillway sections	cy	52,800	16.00	15.90
diversion tunnel walls	cy	21,400	26.00	21.90
plugs	cy	26,000	15.50	16.30
spillway bridge	cy	7,500	48.50	53.70
bridge piers	cy	23,000	24.50	23.00
sidewalks, curbs & parapets	cy	2,400	64.50	65.20
spillwy traing walls	cy	3,500	21.00	30.50
retaing walls	cy	15,000	17.50	18.40
apron	cy	96,700	11.50	15.80
nor bulkhd abv el 220'	cy	6,100	32.00	34.30
elev & stair towers	cy	12,300	32.00	24.80
blockouts	cy	570	100.00	77.00
Integral floor finish	sf	10,200	0.65	0.32
Asph seals, contractn jt	cf	570	20.00	13.30
Premolded jt filler	sf	4,060	0.80	0.70
Expansn jt sealer	lb	475	1.75	.60
rubr wtr stps, std instl	lf	10,900	3.50	2.90
prot instl	lf	10,000	5.00	7.50

(Continued on page 156)

5 years of job-proved savings in portable air-power costs

600 cfm GYRO-FLO portable compressor serving two Wagon Drills on a highway improvement project.

600 CFM GYRO-FLO rotary compressors

Five years ago, Ingersoll-Rand pioneered a new revolutionary portable compressor with no pistons, rings, rods or valves—the 600 cfm GYRO-FLO. Its advantages over the reciprocating compressor were so great that it looked almost too good to be true. Hence there was much speculation as to how it would stand up under actual on-the-job conditions.

Today, there can be no room for doubt. The 600 cfm GYRO-FLO has won its service stripes in the world's toughest proving ground—the heavy construction field. Five years of performance on all kinds of jobs have proved its outstanding economy, dependability and remarkable freedom from maintenance. Smaller—lighter—smoother running—air temperatures under 200°F—low oil consumption—closer regulation at all loads from 0 to 100% capacity. These advantages are a matter of record.

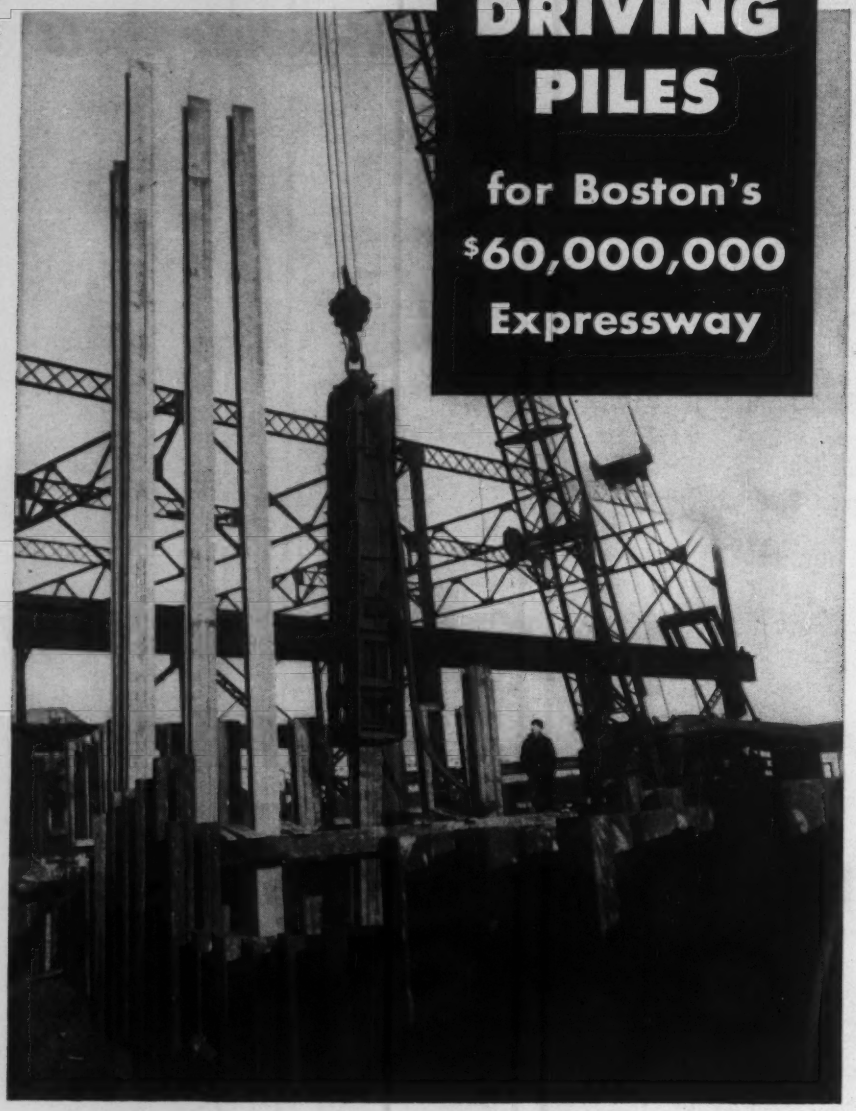
Available in 125, 210, 315 and 600 cfm sizes, the GYRO-FLO, with five years of time proven experience, stands out as the finest portable air power plant obtainable. Ask your I-R representative for the complete, cost-saving details.

Ingersoll-Rand

2-227 11 Broadway, New York 4, N. Y.

IR CONTRACTORS' COMBINATION

COMPRESSORS • ROCK DRILLS • AIR TOOLS • CARSET JACKBITS • PUMPS



This McKiernan-Terry Type S8 Single-Acting Pile Hammer is shown driving 89-lb. H-piles for piers of the double-deck high-level bridge over the Charles River for this outstanding traffic artery.

Here, as in many thousands of foundation jobs . . . large and small . . . for bridges, dams, buildings, piers, highways, etc. . . . contractors use McKiernan-Terry Single-Acting and Double-Acting Pile Hammers and Double-Acting Pile Extractors to assure speedy and economical work.

Write for bulletins describing McKiernan-Terry Pile Hammers and Extractors. MK367

McKIERNAN-TERRY CORPORATION

80 Richards Avenue, Dover, New Jersey

Manufacturing Engineers • Plants: Harrison, N. J., Dover, N. J.

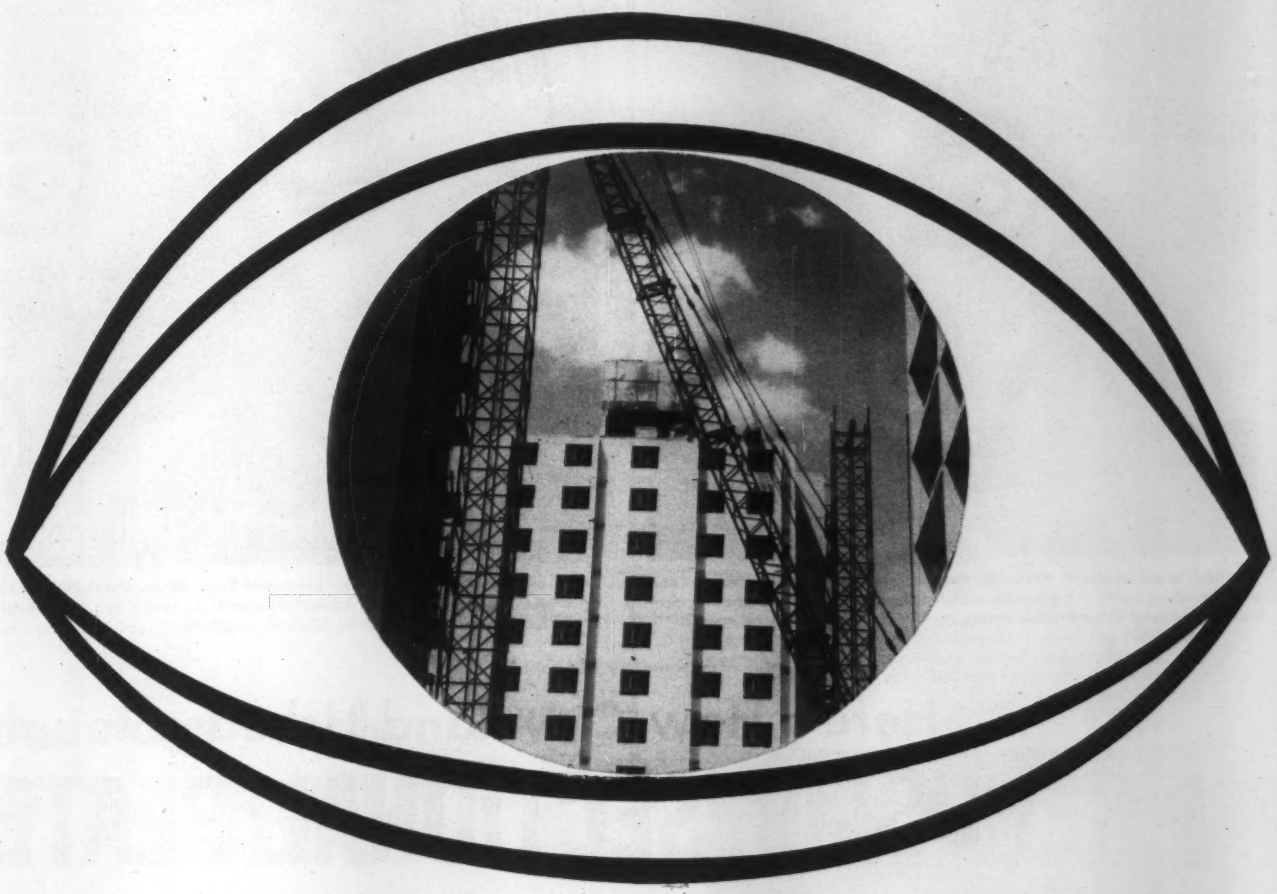
Also builders of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery

UNIT PRICES

(Continued from page 154)

Bids: 3-24-55 Items	Unit	Quantity	Unit Prices 1C	2
Asph ctgs, contractn jts.	sf	43,500	0.80	0.14
Met cover plates over grout grooves	lf	3,200	1.25	1.10
Membrane waterproofing	sf	7,500	0.35	0.33
Dampproofing	sf	13,000	0.15	0.19
Conc cover slabs over membrane waterproofg	cy	110	30.00	44.40
Divern tunnl pier noses.	cy	6,850	28.00	30.00
Structural steel				
Spillway bridge, f&i	lb	4,200,000	0.16	0.19
Crane rails & gate transfer rails, f&i	lb	596,000	0.20	0.20
Guard houses, f&i	lb	66,000	0.20	0.22
Architectural finish				
Conc block msry	sf	750	0.75	1.64
Struct facing tile	sf	3,800	1.75	1.90
Insul alum wall panels	sf	5,400	2.80	3.85
Stl roof decking	sf	1,800	0.65	1.00
Roofing, incl vapr barr insul & flashg	sf	1,650	0.55	0.50
Misc metlwk, stl & iron	lb	382,000	0.40	0.50
Alum, except front entrances & windows	lb	4,000	1.25	2.45
Alum incl glazing:				
doors & frames	ls	.....	5,000	10,000
windows & frames	sf	200	5.00	12.20
Hollow met doors, incl prssd met frmes hdwre.	sf	200	5.00	11.70
Hardware, furnish	ls	.....	500.00	1,600
Met toiled enclosures	lf	35	12.00	25.80
Shower cabinets	ls	.....	400.00	1,500
Toilet room accessories	ls	.....	125.00	530.00
Lockrs, shelvg, mop rcks	ls	.....	250.00	6,850
Quarry tile floor	sf	1,400	1.75	2.80
Susp plaster ceilings, gypsum plaster finish	sy	30	5.50	23.20
Keene's cmt finish	sy	30	6.00	24.10
Paint & finish	ls	.....	2,750	2,900
Porc enam letters	ls	.....	200.00	1,200
Staff gauge	ls	.....	1,000	1,690
Equipment				
Install twrs, spiwy gtes	lb	3,223,000	0.04	0.05
fixd wheel gtes	lb	6,195,000	0.06	0.07
cranes	lb	650,000	0.05	0.05
gte hoists	lb	1,550,000	0.05	0.05
Install & test:				
air compressors	lb	8,500	0.50	0.55
centrif wtr pump units.	lb	600	4.00	0.40
vert sump pmps, cntrls	lb	3,000	1.40	0.33
chlor & wtr filt equip	lb	750	2.75	0.40
Install elec space htrs	lb	3,000	1.25	1.00
Install ventilating fans	lb	3,500	0.50	0.25
Ventilating ducts, f&i	sf	800	2.50	1.20
Storage wtr heaters, f&i	ea	2	250.00	144.00
Install wtr storage tank	lb	1,100	0.30	0.95
Furnish & install:				
lavatories	ea	4	200.00	100.00
water closets	ea	3	225.00	84.00
Urinals	ea	1	260.00	140.00
service sinks	ea	2	250.00	130.00
drinkg water fountains	ea	3	170.00	120.00
Install port fire exting	ea	20	10.00	13.00
Furnish & install:				
MP, fitg & vlv 0–2"ϕ	lb	2,000	0.60	0.80
2½–6"ϕ	lb	28,000	0.50	0.54
embedded brss P & fitg for air bubbling sys.	lb	3,800	1.00	1.20
embedded CI soil P & fitg; roof, deck, flr & plumbg drains	lb	25,000	0.25	0.30
P hangers & supports	lb	1,500	1.00	1.05
embedded inserts	lb	1,200	1.25	1.15
embedded WIP & MI fittings, 2" & 4"ϕ	lb	13,000	1.75	0.70
Grilles registrs, fixd louvrs, dampers, l	lb	500	0.50	0.50
Showers, f&i	ea	2	100.00	220.00
Septic tanks, 2	ls	.....	350.00	4,000
Install sewage ejector	ls	.....	600.00	600.00
Electrical				
Unload, handle, store & move matl for elec contractor	ls	.....	5,000	13,000
Furnish & install:				
grounding system	lb	5,500	2.00	1.90
met cond, incl boxes & fitg, size A	lb	25,000	1.60	1.30
size B	lb	2,500	9.50	1.60
size C	lb	3,500	2.60	1.60
nonmet cond incl fitg	lf	100	9.50	1.00
special conduit boxes	lb	100	18.00	6.40
Buildings				
Administration building	ls	.....	200,000	330,000
Laboratory	ls	.....	35,000	33,000

Liquidated damages:
•Pub observ facilities 6–15–55; damages $500/day
•Admin bldg & lab 6–29–55, $500/day •Work nec to permit start of raising pool to elev 235, 7–1–58, $5,000/day
•All work 12–30–58, $1,000/day, reduce to $200/day if minor work; no charge if compl except for rem contr plant



Got your eye on a big job?

When time comes to make your bid, make sure you have the extra advantage of the *lowest bond rates available.* They can often make the difference between acceptance and rejection.

Ask your Indemnity Company Agent to establish your credit line now with Indemnity Insurance Company of North America. This leading independent company offers the lowest bond rates* to contractors of *skill, integrity and responsibility.*

You save money, too, with Indemnity's low rates. And an established credit line assures you of getting bonds on future jobs without delay. See the Indemnity Company Agent today.

**Sorry, Indemnity's low rates are not available in Texas and Louisiana.*

PROTECT WHAT YOU HAVE©

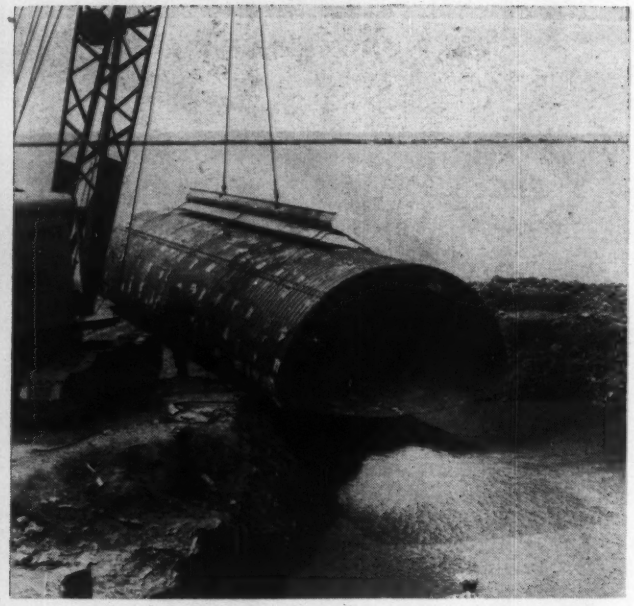
INDEMNITY INSURANCE COMPANY OF

NORTH AMERICA

One of the North America Companies, which are headed by Insurance Company of North America, founded 1792

Philadelphia 1, Pa.

Shipped knocked-down, these lightweight sections assemble easily and quickly—using special bolts, nuts and washers. Thick asphalt coating provides extra protection for this enclosure.



Crane prepares to swing 44-foot section of Republic Sectional Plate Pipe-Arch into excavation on Cleveland lakefront drainage job. Extra-wide 12′ 6″ base increases the volume of water handled.

Here's How Cleveland Licked a Tough

REPUBLIC SECTIONAL PLATE

Manufacturers of Toncan Drainage Products

BARK RIVER CULVERT & EQUIPMENT CO.
Bark River, Mich.
Ironwood, Mich.

BEALL PIPE & TANK CORPORATION
Portland, Ore.
Boise, Idaho

BERGER METAL CULVERT CO., INC.
Westminster Station, Vermont

THE BOARDMAN CO.
Oklahoma City, Okla.
Tulsa, Okla.

BLUEGRASS PIPE & CULVERT CO.
Louisville, Kentucky

CENTRAL CULVERT CORPORATION
Alexandria, La.

CHOCTAW, INC.
Memphis, Tenn.
Birmingham, Ala.

DOMINION CULVERT & METAL CORP.
Roanoke, Va.

EATON METAL PRODUCTS CORP.
Omaha, Neb.
Hutchinson, Kan.

EATON METAL PRODUCTS COMPANY
Billings, Mont.

EMPIRE STATE CULVERT CORP.
Groton, N. Y.

ILLINOIS CULVERT & TANK CO.
Peoria, Ill.

JENSEN BRIDGE & SUPPLY COMPANY
Sandusky, Mich.

H. V. JOHNSTON CULVERT CO.
Minneapolis, Minn.
Aberdeen, S. Dak.

LOGANSPORT METAL CULVERT CO.
Logansport, Ind.

M & M HIWAY MATERIALS CO.
Columbia, Mo.

NORTH DAKOTA METAL CULVERT CO.
Fargo, N. D.

REPUBLIC STEEL CORPORATION
Culvert Division
Canton, Ohio
Philadelphia, Pa.

SPOKANE CULVERT & FABRICATING CO.
Spokane, Wash.

THOMPSON PIPE & STEEL COMPANY
Denver, Colo.

TRI-STATE CULVERT & MFG. CO.
Tampa, Fla.
Decatur, Ga.

UTAH CULVERT COMPANY
Ogden, Utah

WISCONSIN CULVERT COMPANY
Madison, Wis.

WYATT METAL & BOILER WORKS
Dallas, Tex.
Houston, Tex.

A big increase in carry-off capacity was needed. Lake Erie was the logical terminus but the only route to the lake lay through loose, unstable soil. Large diameter full-round pipe required too much headroom. A multiple installation of small pipe was too costly.

To solve this problem economically, engineers selected Republic Sectional Plate Pipe-Arch. Its lightness compared to its size—plus its shape—made it particularly suitable where limited headroom and soil conditions prohibited the use of full-round pipe. The broad, flat-bottomed shape transmits a greater volume of water than round pipe of equivalent size under conditions of low headroom.

Republic Sectional Plate Pipe-Arch offers all the inherent good qualities of metal such as resiliency and flexibility. It won't crack, crumble or spall; is unaffected by impact or vibration and will not disjoint from shifting foundations. Made of Toncan Iron—containing copper and just the right amount of molyb-

REPUBLIC

World's Widest Range of Standard

Twenty-ton section is lowered into place as 1850-foot installation nears completion. The joining of sections while pipe is in water is another advantage of Republic Sectional Plate Pipe-Arch.

Drainage Problem with PIPE-ARCH

denum—it offers the highest rust-resistance of any ferrous metal in its price class.

Like other Republic Drainage Structures, Sectional Plate Pipe-Arch is easily installed in any weather with unskilled labor. Lightweight sections reduce shipping, handling and installation costs. A single order covers all materials—including specially designed bolts, nuts and washers.

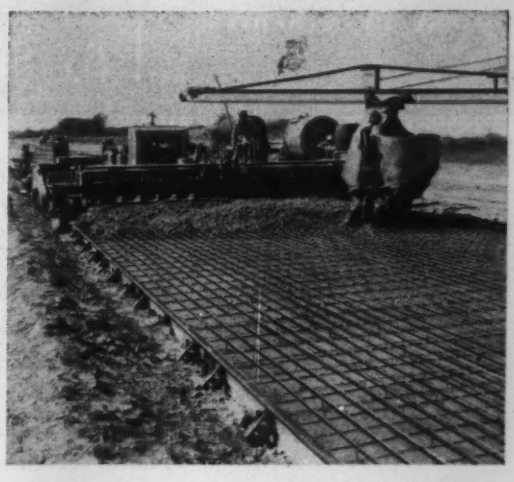
One of the Drainage Products Manufacturers listed on the opposite page can give you "specs" and engineering data on all types of Toncan Drainage Products. Or send coupon for literature.

Here are other Toncan Drainage Products made from Republic Toncan Iron and Republic Copper Steel—

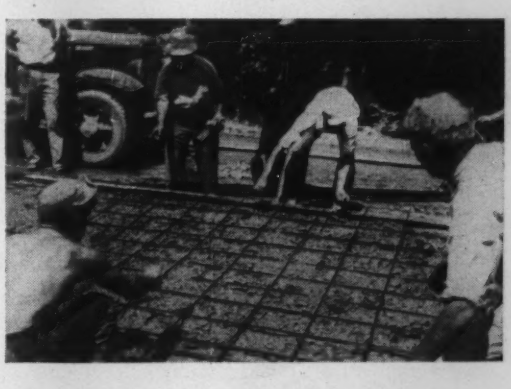
Corrugated Metal Pipe—Perforated Corrugated Metal Pipe—Sectional Plate Pipe—Sectional Plate Arches—Corrugated Metal Pipe-Arch—Sectional Plate Pipe-Arch—CorWel Subdrainage Pipe—Asphalt Coated Pipe—Asphalt Coated and Paved Pipe.

STEEL

Steels and Steel Products



A CUSHION FOR 180-TON WALLOPS! This runway will soon be absorbing the crushing impact of today's huge intercontinental aircraft as they come to earth for landings. To withstand such punishment, runways are reinforced with steel bars that tie the concrete together, yet provide enough resiliency to resist cracking. The Truscon Division, pioneers of reinforced concrete, now offers immediate delivery of reinforcing steel bars. Send coupon for illustrated literature on Truscon Reinforcing Products.



A RIBBON OF CONCRETE WITH A BACKBONE OF STEEL. Here's another of the nation's highways that is being reinforced by welded wire fabric to stay safer, last longer. This construction provides high resistance to cracking and deterioration—is less likely to suffer from water and freezing damage. A product of Republic's Truscon Steel Division, welded wire fabric is available through a nationwide warehouse service. Send coupon below for additional facts.

REPUBLIC STEEL CORPORATION
3114 East 45th Street,
Cleveland 27, Ohio

REPUBLIC STEEL

Please send me information covering details on:

☐ Republic Drainage Products
☐ Truscon Reinforcing Products

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

K-8314

ONE OF A SERIES

You Get Many Benefits
By Specifying VICKERS® Hydraulics

Reduced Maintenance Costs

Vickers Oil Hydraulic Equipment is built to minimize maintenance . . . has an outstanding performance record. Nevertheless, Vickers recognizes that sooner or later any piece of machinery requires overhaul. So we have developed a service department of exceptional efficiency . . . one that is convenient for you by reason of full time factory-trained service men working out of our offices from coast to coast.

Shown below are several of the practical aids provided to assure you quick and economical service on Vickers Hydraulics.

VICKERS Incorporated
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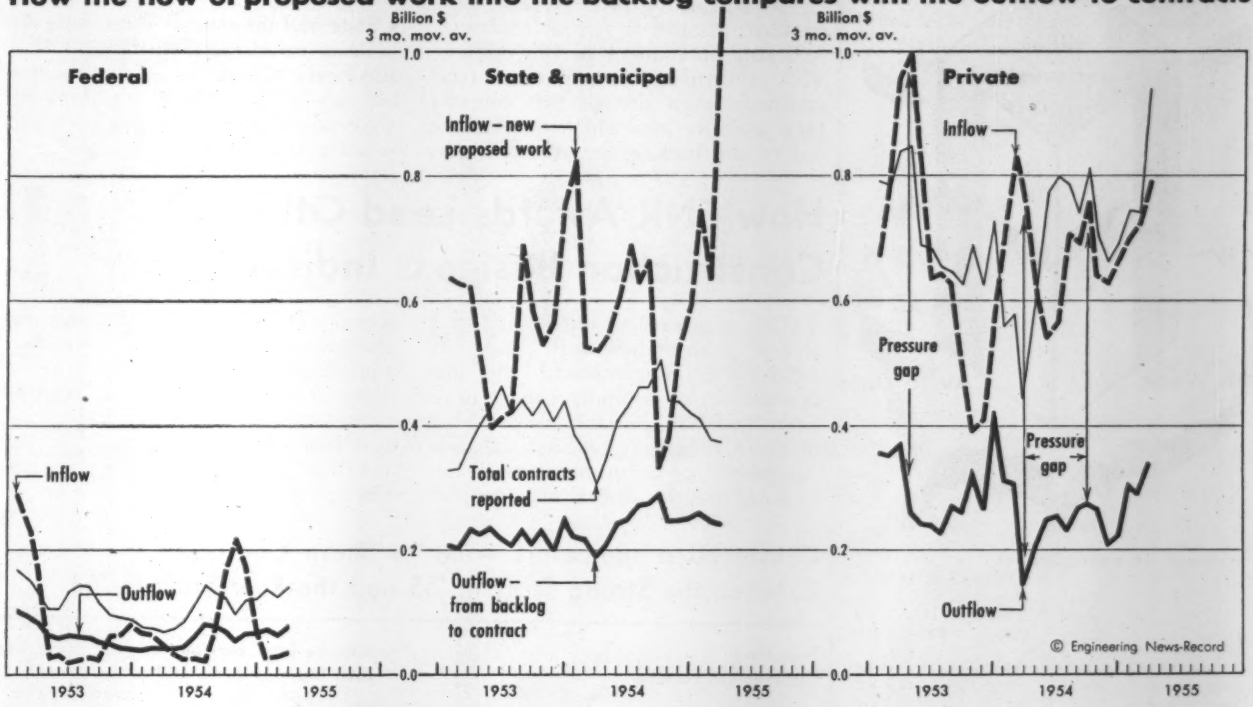
7143

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

How the flow of proposed work into the backlog compares with the outflow to contracts



Flow of Proposed Work Speeds up

Judging from the terrific pace that new work is being proposed, there can be little doubt that the current record-setting level of heavy construction can be sustained (charts, above).

New heavy construction projects proposed during the first quarter of 1955 added up to a promising $5.7 billion, as reported by ENR. That's 44% above the value of new work proposed in the first three months a year ago. And it's second only to the record $6.5 billion established in the first quarter of 1951 when defense plants were being rushed to the drawing boards.

State and local projects account for most of the big rise in 1955 over a year ago. For the first quarter they have a record value of $3.2 billion, more than double the estimated cost of jobs proposed in the first quarter of 1954. Except for waterworks and sewerage, all major types of state and local construction are piling into the backlog at a faster rate than they did a year ago.

• **Private work**—Private work is also starting off the year with a rush of proposed work which adds up to a total value of nearly $2.4 billion. That's about the same amount as the estimated cost of projects proposed in the first quarter of 1954, which had the largest total of proposed in any quarter of 1954.

Figuring in this flood of new private work is $778 million in mass housing—a new first-quarter high and more than double the value proposed a year ago. Industrial building added the largest quarterly volume of proposed plants since the first quarter of 1953. Jobs with an estimated total cost of $779 million were proposed.

Commercial building, sparked by shopping centers, came up with $590 million going into the backlog this year. That's the biggest quarter for this category since the final quarter of 1953.

• **Federal work**—Federal proposed work, on the other hand, has slumped to only $104 million in 1955, about two-thirds of the unimpressive volume a year ago. However, the flood of new proposed work in the autumn of 1954 should keep the heat on the federal contracts.

• **Pressure growing**—When new heavy construction projects move into the planning stage faster than other jobs move out into contracts, a "pressure gap" develops. This pressure eventually brings an increase in the volume of work moving out of the design stage into contract.

A look at the chart shows how this works out. The best example is private construction because there is generally a shorter lag between the time a private project is proposed and when it goes to contract than in the case of public works.

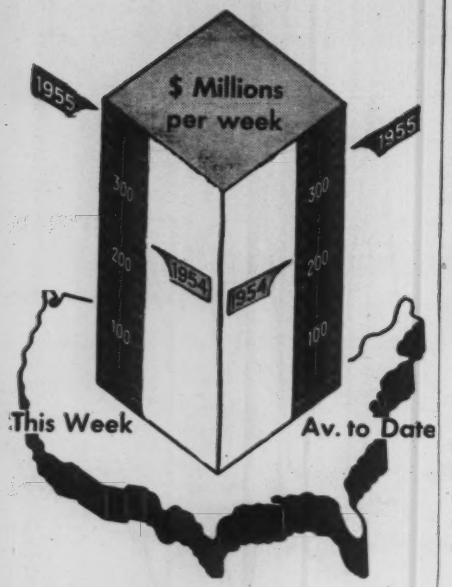
• **How it works**—The right-hand panel of the chart shows three "pressure gaps" which developed during the 1953-'54 period. These gaps show the points with the widest spread between the rate new work is proposed and the rate other jobs move out of the planning stage into contract. Notice how each of these gaps is followed, some months later, by an upturn in the volume of work moving out of the backlog into construction.

• **Lag**—There's no way of telling just how much outflow of awards from the backlog will react to changes in pressure within the backlog. This is because the lag time between the date work is proposed and the date it goes

(*Continued on page 162*)

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 16 wks 1955	1954	% chge
Federal	$32.9	$525.5	$288.4	+82
State and municipal	116.2	1,488.4	1,311.5	+13
Total public	149.1	2,013.9	1,599.9	+26
Total private	233.7	3,343.6	2,065.0	+62
U. S. Total	$382.8	$5,357.5	$3,664.9	+46
Contracts by type of work				
Waterworks	$5.4	$82.2	$62.2	+32
Sewerage	8.5	120.9	102.0	+19
Bridges	14.3	148.9	122.3	+22
Highways	55.9	575.0	443.4	+30
Earthwork, waterways	12.4	139.3	84.7	+64
Buildings:				
Public, excl. hsg.	20.3	498.7	504.6	−1
Housg., public	10.2	63.1	59.0	+7
Housg. private	59.0	1,959.3	1,151.2	+70
Commercial	38.7	490.4	358.1	+37
Industrial	96.7	684.5	485.4	+41
Unclassified	61.4	595.2	292.0	+104
Total	$382.8	$5,357.5	$3,664.9	+46

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)	Week of April 14 1955	Cumulative 15 wks 1955	% chge '54-'55
Corporate securities	$61.4	$866.0	+0.3
State and municipal:			
All except housing	44.2	1,158.4	−17
Housing	4.2	46.1	+8
Federal loans	1.7	24.9	−38
Federal aid	...	...	...
Total non-federal	$111.5	$2,095.4	−10
Federal appropriations:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	$111.5	$2,095.4	−10

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	4/14	648.27	311.62	135.90
	3/31†	647.49	311.25	135.74
Building cost	4/14	461.34	249.39	131.14
	3/31†	460.62	249.00	130.94
Volume	Mar.	691	281	200
	Feb.	459	187	133

†Official monthly index for April

into contract varies widely for different projects.

This theory of the "pressure gap" works in practice as a reliable advance indicator of changes in the outflow. This in turn can be applied to total contracts, even though this contract total includes jobs which don't come out of the backlog but which bypass the proposed stage and go directly to contract.

• **State and municipal**—Pressure is also building up within the backlog of state and local construction. While the flow out into contract this year is above the 1954 period, new work has been proposed at much faster rate.

How ENR Awards Lead Other Construction Business Indicators

ENR is presenting for the first time a comparison of how orders and shipments of building materials and sales of construction equipment move in relation to ENR contract awards. Most of these indicators on materials and equipment are not available until two or more months after ENR's contract series. The table (below) and the charts on the opposite page show how consistently nearly all of these figures were down with ENR's contract awards as determined for last spring, and how nearly all of them are up with the boom taking place in contract awards this year.

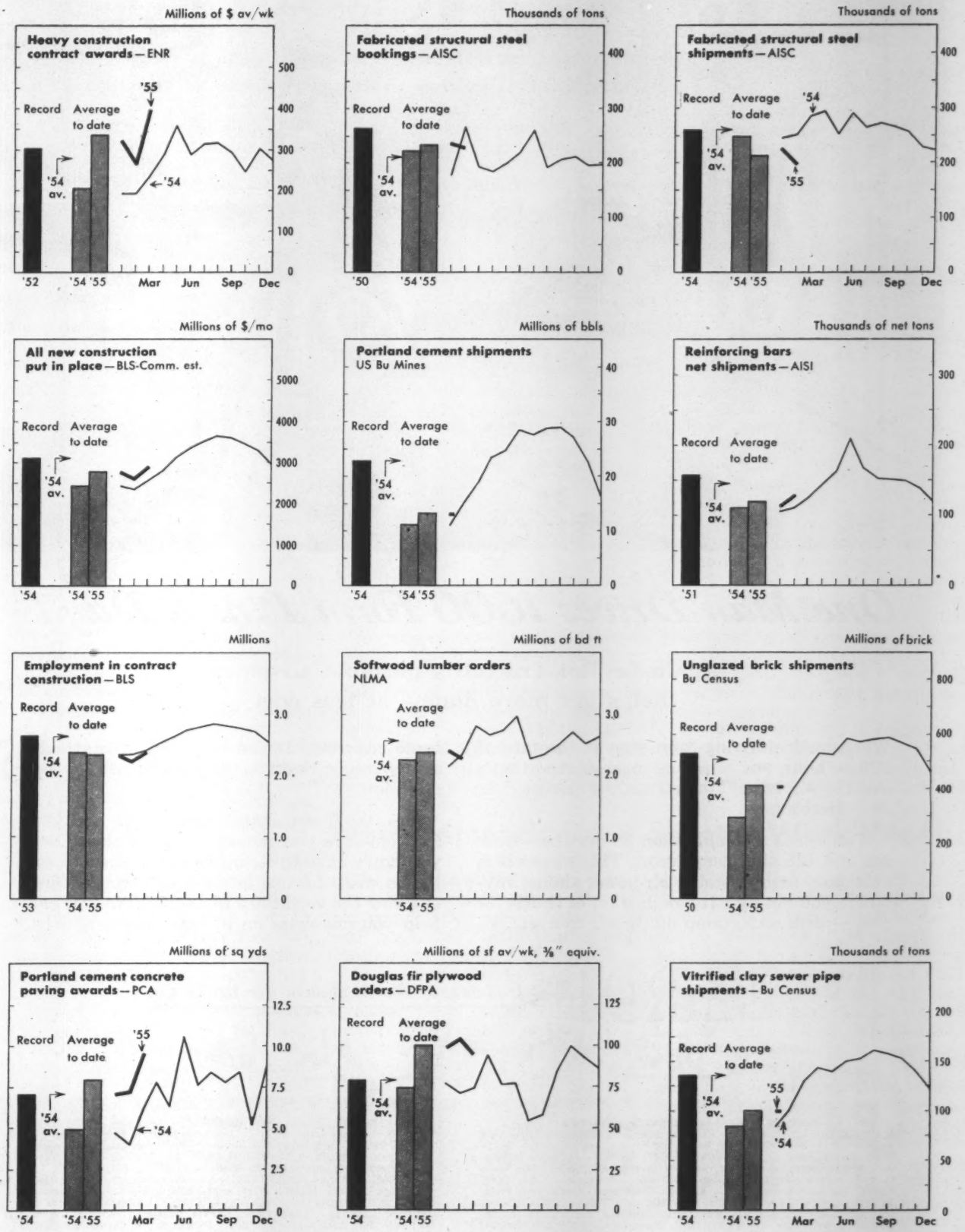
Construction Indicators Point to Sharp Contrast Between the Strong Start in '55 and the Poor Start in '54

Indicators	% Change from previous year in cumulative total business at the end of each month 1954 Jan.	Feb.	Mar.	1955 Jan.	Feb.	Mar.
Construction volume						
Hvy. construction contracts—ENR	−49	−41	−34	+69	+58	+63
New construction put in place (a)	+2.0	+1.5	+4.4	+13	+13	+13
Cem. concrete paving awards (b)	− 3	+ 5	− 4	+51	+65	+61
Materials movements						
Fab. struct. steel bookings (c)	−33	− 1	−10	+35	+ 5	na
shipments	+ 2	+ 1	+ 3	−11	−14	na
Reinforcing bar net shipments (d)	−24	−27	−27	+ 5	+ 9	na
Portland cement shipments (e)	−18	− 5	− 7	+20	na	na
Softwood lumber orders (f)	−15	− 8	− 4	+14	+ 9	na
Douglas fir plywood orders (g)	na	na	na	+29	+38	+34
Unglazed brick shipments (h)	−17	− 8	− 4	+40	na	na
Vit. clay sewer pipe shipments (h)	−11	− 8	− 7	+18	na	na
Equipment shipments, sales						
Excavating & Earthmoving Equip (h)	....	....	−29	....	....	na
Caterpillar Tractor Co. sales	....	....	−20	+14	+24	na
Number of series moving up or down together						
Construction volume Lower	2	1	2	0	0	0
Higher	1	2	1	3	3	3
Materials and equipment Lower	6	6	8	1	1	0
Higher	1	1	1	8	5	1
Employment and contractor failures						
Contract constr. employment (i)	−1.4	−0.8	−0.2	+0.4	−1.7	−1.3
Contractor failures, number (j)	+10	+19	+36	+ 1	+ 3	− 9
Liabilities	+16	+19	+51	+186	+130	+46

a. BLS-Comm. est. b. Sq Yd, PCA c. AISC d. AISI e. Bu. Mines f. NLMA g. DFPA h. Bu. Census i. BLS est. j. Dun & Bradstreet

How 1955's Record Start in Contracts and Activity . . .

. . . Is Increasing the Demand For Construction Materials



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Secondary Boycotts Backfire

Tougher policy trips up union efforts to organize general contractors by putting pressure on neutral subcontractors

The NLRB and the courts have cracked down again on secondary boycotts in the construction industry. In four instances, involving two disputes on each coast, the trend has been toward a tougher policy in the application of one of the most difficut provisions of labor law.

Two of the cases had their genesis in the vigorous campaign conducted by the Baltimore Building and Construction Trades Council to organize open-shop general contractors (ENR, Nov. 18, 1954, p. 158). The others were a culmination of long-standing disputes between West Coast unions and Cisco Construction Co. of Portland, Ore.

• **Baltimore council**—The results in Baltimore were a severe blow to the council. In each case, the council was ordered to cease putting pressure on the generals by pulling employes of neutral subs off their jobs. Covered by the orders were Baltimore projects of general contractors Henry J. Knott, Inc. and Garden Construction Co., and four Nike bases being constructed for the Corps of Engineers by Dominion Contractors, Inc.

Going to the core of the problem where pressure on a general contractor takes the form of forcing his neutral subs to cease performance of their contracts with the general, a federal court declared the picketing of Knott and Garden projects illegal. Reversing an earlier decision of the NLRB, the court declared that "This was clearly engaging in a secondary boycott within the prohibition of the statute and the consequences thereof may not be avoided by reason of the fact that the ultimate purpose was to organize the workers of the general contractors. . . ."

One of the determining factors was the failure of picket signs to clearly relate the dispute to the general contractors. But in the Dominion case, decided by the NLRB, this factor carried little weight. In accepting the stipulation entered into last fall between the council and Dominion to end the strike, the board virtually reversed the position it took with respect to the Knott and Garden picketing.

• **Cisco disputes**—West Coast unions were similarly rebuffed in the Cisco rulings.

In the first situation of its kind to come before the board, the Pasco-Kennewick Building Trades Council was found to have violated the boycott provisions when its members struck last year at the AEC Hanford Works, near Richland, Wash. The strike was called when Cisco's sub, non-union Shultz Electric Co., came on the job. As a result, work on the entire project came to a standstill.

Behind the strike were the council's repeated and unsuccessful efforts to get Cisco to recognize the unions.

In a split decision, the board based its ruling on the illegal objects of forcing Cisco to cease operations with Shultz and to recognize uncertified labor organizations. One board member, opening up the knotty problem of whether the statute affords protection to a federal agency, viewed the object as forcing the AEC to cease doing business with Cisco.

An unusual aspect of the case was member Murdock's dissent. He saw no secondary boycott because he could find no neutral employer under the multi-employer collective bargaining procedure established by the AEC.

The second Cisco dispute, springing from the same background, was more simple in form. Picket lines were thrown up around Cisco projects in Seattle in a dispute between Cisco and carpenters over travel pay and fringe benefits.

When teamsters, driving concrete delivery trucks refused to cross, Cisco leased the trucks and put its own men aboard. The carpenters countered by picketing the cement plant and there won the support of teamsters and operating engineers. Meanwhile, an official of the pavers union tried to prevent Cisco from getting cement blocks at another plant.

All four unions were held guilty of secondary boycott violations by an NLRB trial examiner.

• **General aspects**—Biggest contributor to the difficulty of distinguishing lawful from unlawful pressure activities, constituting secondary boycotts in the construction industry, is the presence of both primary and secondary employers at a common site.

Normally, the board has held that where employes on a construction project strike neutral employers to force them to cease doing business with the employer involved in the labor dispute, a prohibited secondary boycott exists. Various rules have been laid down as guideposts in the troublesome area of a common site. Thus, a strike at a common site is generally considered permissible if:

- The primary employer is engaged in his normal business at the site at the time of the strike.
- Picketing is limited to places reasonably close to the site.
- The dispute is clearly designated as one with the primary employer.

New Demands for a Shorter Work Week

Demands for a shorter work week, listed by organized labor as next on the agenda after the guaranteed annual wage, are already hitting the construction industry.

In Rochester, N. Y., where many of the building trade agreements expire next week, current negotiations have been reduced to a fight for a 35-hour week at 40 hours pay. Unions which have voiced the demand for the first time are the plumbers, laborers, electricians, operating engineers and asbestos workers. Carpenters and bricklayers are expected to follow suit.

The negotiations are being conducted between the unions individually and the various contractor groups in the area. Present indications are that the goal will not be achieved. So far, the demands have not included higher wages or increased welfare benefits as alternatives. Contracts have traditionally run for one year.

Across the border in British Columbia, other locals of the AFL are seeking a similar goal. Carpenters are pressing for a 7-hour day plus an hourly wage increase of 31 cents and a 4% vacation allowance. Painters asked for a 7-hour day with no reduction in take-home pay, but dropped the demand in favor of one for a 10-cent wage increase.

Goals of other Canadian unions are 10 cents an hour increase for sheet-metal workers and 20 cents for la-

(*Continued on page 166*)

borers. Employers are generally maintaining a hold-the-line policy although some are demanding wage roll-backs. Metal workers have been asked to take a cut of 31 cents an hour.

Adding to the friction in the Vancouver area is a dispute between six trade unions and the newly formed Saguenay-Kitimat Construction Co., of Vancouver, Aluminum Co. of Canada subsidiary handling construction for a $190-million expansion program at Kitimat. Union locals object to having Saguenay negotiate with international representatives on their behalf. Carpenters already have repudiated the results of those negotiations and the situation is believed headed for government mediation.

AFL economists have been laying the groundwork for a shorter work week for some time. They argue that the economic forces of an expanding economy cannot cope successfully with the employment problem created by increasing productivity and labor force growth. "This is why a general reduction in the standard work week is assuming so much importance," says AFL's staff economist Seymour Brandwein. And, he adds, the time to seek the reduction is "while the economy of the particular industry is relatively healthy."

Negotiations Slow Down In Arizona, New Mexico

Preliminary negotiations on new contracts with the building trades in Arizona and New Mexico met with little success.

After turning down a union proposal for separate negotiations with the ironworkers (ENR April 7, p. 118), Arizona contractors have come forth with these proposals:

- Retention of a five-year contract.
- A 2% wage increase, which would amount to about 20 cents over the five-year span.
- Inclusion of a cost of living escalator clause.
- Extension of the agreement to cover bricklayers, plasterers and lathers. The present five-year agreement, which expires May 31, covers laborers, carpenters, cement finishers, ironworkers, teamsters and operating engineers.

In Albuquerque, negotiations between the New Mexico Building and Construction Trades Council and the Building Division of the AGC dragged into a stalemate. Principal union demands were for wage increases ranging from 15 to 37½ cents an hour.

The U. S. Mediation and Conciliation Service stepped in when negotiations failed. Although the old contract expired without a new one to replace it, the unions' initial reaction was to postpone any strikes because of the large amount of defense work which would be tied up.

Unions represented in the negotiations by the council are carpenters, teamsters, operating engineers, cement finishers, ironworkers and laborers.

Union President Halts Critical Labor Dispute

Martin Durkin, president of the international plumbers union, has cracked down on pipefitters who staged a walkout over a "stop-loafing" order issued at the Clifty Creek power plant under construction at Madison, Ind.

In a swift and unusual move, he banned all further work stoppages at the plant and backed the contractor in the firing of the 600 striking employes. In effect, Durkin's Chicago office took over the pipefitting work from the strikers' Local 605 and told employes who want their jobs back to apply to the union's international representative. Durkin said he took the action because the plant "is a vital link in our national defense atomic program."

The stop-loafing order was issued by the B. F. Shaw Co., Wilmington, Del., contractor doing part of the construction for the Indiana-Kentucky Electric Co., which will feed power to the AEC plant at Portsmouth, Ohio. Pickets established after the walkout turned away 2,750 other construction workers.

Three Unions in Denver Agree on New Contracts

New contracts which extend present wage scales for another year have been worked out in Denver, Colo., with local units of the AFL bricklayers, plumbers and pipefitters unions.

In working out the agreements, the biggest concession to the plumbers and pipefitters fell in the area of fringe benefits. The new contract established an employer-financed group insurance fund, effective June 1.

Basic wage scale for journeymen in both unions—Plumbers Local 3 and Pipefitters Local 208—is $3.05. The contractor groups which negotiated the new contract were the Denver Association of Plumbing Contractors, and the Heating, Piping and Air Conditioning Contractors of Denver.

The new bricklayers contract was negotiated by Local 1 and the AGC. It carries over for another year the present journeyman's rate of $3.50.

Labor Briefs . . .

• **Cement workers win pay increase**—New contracts, granting wage increases from six to nine cents an hour, have been signed by the cement workers union and 17 cement plants in Pennsylvania's Lehigh Valley. The contracts extend the existing pension plan for another three years.

• **Bricklayers lead off**—Local 1 of the bricklayers union in St. Louis has joined masonry manufacturers and contractors in the formation of the Unit Masonry Association of Metropolitan St. Louis. Aim of the association, whose temporary chairman is the local's business agent, is to improve and promote masonry construction.

• **Labor advisors**—Secretary of Labor Mitchell has oppointed a special study committee to advise on labor problems at atomic energy installations. Named to the committee are John T. Dunlop, chairman of the Joint Board for the Settlement of Jurisdictional Disputes; Charles A. Sprague, former Governor of Oregon; and John W. Nickerson, a labor-management consultant in Niantic, Conn.

• **Right-to-work law tested** — The Building Trades Council of Reno and Vicinity collided with Nevada's right-to-work law in its effort to obtain construction work at a motel. The motel owner was put on a union blacklist because he wouldn't agree to use union help, provided the unions could supply his needs within 48 hours. Despite the qualification, said the Nevada Supreme Court, it's still a violation.

• **Racketeering**—Orell B. Soucie, international representative of the operating engineers, was fined $10,000 and sentenced to five years in prison for racketeering. He was charged with demanding a price for labor peace on a highway construction job in Illinois. Soucie was one of 22 leaders indicted in East St. Louis last summer after a sweeping investigation of labor activities in the construction industry.

• **Strikes at Nike bases**—Latest of a series of labor disputes among workers at Nike bases occurred last week at Pittsburgh when electrical workers left their jobs in protest against work assignments to elevator constructors. The strikers were ordered back to work by the Joint Board for the Settlement of Jurisdictional Disputes and told to iron out the differences.

C. J. Langenfelder Co. of Baltimore, Md. is using all types of Euclid equipment to move 4½ million yards on the Northeast Extension of the Pennsylvania Turnpike. Here a "Euc" Scraper with Torqmatic Drive and 29.5 x 25.00 tires gets a heaped load of about 17 bank yds. for a half mile haul to the fill.

Euclid Availability Pays Off
on another tough job for Langenfelder

● Men who know their earth moving equipment specify "Eucs" for their tough jobs. They know they can depend on Euclids to move more loads per hour at the lowest cost per ton or yard of material moved.

C. J. Langenfelder Co. is a good example. This well-known contractor has been a "Euc" owner for nearly 20 years and last year bought 52 more Euclids for highway and other earth moving jobs. For a 3-section contract on the Northeastern Extension of the Pennsylvania Turnpike, Langenfelder decided on 3 spreads of "Eucs" to move the bulk of 4½ million yards.

Four Euclid Scrapers of 15.5 yd. struck capacity and two Euclid Twin-Power Scrapers are moving 800,000 yds. on Section G . . . hauls average one-half mile with a maximum adverse grade of 10%. Bottom-Dumps of 13 and 17 yd. struck capacity and a fleet of 15 and 22-ton Rear-Dump "Eucs" are working on the other sections.

Langenfelder is standardizing on Euclids with Torqmatic Drive because of their production performance and low operating cost. In spite of tough working conditions caused by weather and the nature of the job, the Euclids are averaging better than 90% availability. Operating personnel say the "Eucs" are getting more work done than any other equipment they've ever used and maintenance costs per machine are lower than they've experienced on any job of this size.

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FINANCIAL AID TO HIGHER EDUCATION

Business Help for Our Colleges A Job for All Business Firms

IN recent months, individual business firms have announced the adoption of a variety of plans, both imposing and ingenious, for financial aid to higher education in the United States. In doing so, they have taken a lead in dealing with a problem of transcendent importance both to the business community and to our nation as a whole.

Previous editorials in this special series have shown that:

1. Our colleges and universities, and particularly the independent, privately endowed institutions, are in grave financial difficulties.
2. These difficulties promise to become much more acute in the years immediately ahead unless extraordinary steps are taken to relieve them.
3. A financially crippled system of higher education is a major national menace.

If, however, the business community is to play an adequate part in helping our colleges and universities financially, the plans adopted by business firms thus far constitute merely a beginning and a set of guide posts. What is required is a general movement on the part of business firms to go to the financial aid of higher education. Such a movement would involve a myriad of individual company plans which, in the nature of the case, cannot be expected to bring great renown or publicity to their sponsors.

Rescue Operation Is Feasible

For the business community as a whole it is feasible to make a major and possibly a decisive contribution to putting our colleges and universities back on their feet financially. One percent of business profits before taxes would do it. In 1954 business profits before taxes were about $35 billion. If one percent of these profits, or $350 million, were contributed to our independent, privately endowed colleges and universities it would enable these institutions (1) to increase the salaries they pay by $200 million a year, and (2) to provide $150 million more for modernization and maintenance of their establishments. In the opinion of competent authorities, this would put these institutions in relatively good working order financially, a process to which a matching grant of $50 million by the Ford Foundation for the improvement of faculty salaries will make a large contribution. It would add about one-fourth to their present annual outlay of about $1.4 billion.

Such a contribution from business would not meet the needs of the independent institutions for new buildings and equipment required to accommodate the great increase in college enrollment anticipated in the years immediately ahead. Neither would it relieve the financial problems of our tax-supported colleges and universities. As a group these institutions have fared better financially in recent years than the

independent institutions. But they also face grave financial problems, particularly in the provision of adequate faculty salaries. It would be far simpler, however, to solve the financial problems of the tax-supported institutions if the independent colleges and universities were back on their feet financially.

One Dollar Does Work of Two

The federal government exempts 5 percent of business profits from the tax imposed upon them if the 5 percent is devoted to religious, charitable or educational purposes. (Most profits are taxed 52 percent.) A contribution of one percent of business profits to higher educational institutions would exhaust only one-fifth of this allowance. It would bring to about two percent the total share of business profits going to both educational and charitable purposes.

In 1953, business firms contributed about $400 million, or slightly more than one percent of profits before taxes to educational and charitable purposes of all kinds. Of this total about $75 million went to educational institutions, mostly colleges and universities.

For some companies it is feasible to contribute more than the average contributed by business generally. Indeed, some companies not only utilize their full 5 percent of tax-deductible funds for charitable and educational purposes but go beyond it. For other companies in financial difficulties no contribution at all is possible.

If, however, those business firms for which it is financially feasible contributed one percent of their profits before taxes to our colleges and universities, the problem of adequate support for the crucially important business of higher education would be far along the way to successful solution. **In 1954 a contribution of one percent of their profits before taxes, or about $350 million, would have reduced business profits after taxes by only about half that amount. This would have meant a reduction of about $175 million, out of a total of about $17.8 billion of profits after taxes.**

Attractive plans to channel financial aid from business to higher education have been abundantly demonstrated recently. These plans, for the most part the creation of large corporations, have included not only a broad array of scholarship grants, but such ingenious arrangements as that by which a company matches with its funds the gifts its employees make to the colleges of which they are alumni.

A full array of these plans, some of which were discussed in an earlier editorial in this series, has been prepared by The Council for Financial Aid to Education (6 East 45th Street, New York City 17) and is available for the asking. Also, colleges and universities have established in most states and regions cooperative associations to help business help them. The Commision on Colleges and Industry (912 Kahn Building, Indianapolis 4, Indiana) distributes a directory of these associations. And, of course, the colleges themselves are always eager to discuss their financial problems with business people and suggest constructive solutions.

Only Small Start Made

The plans for business aid to education which have recently attracted national attention constitute the conspicuous sort of leadership which it is the privilege and opportunity of our great corporations to provide. But the job is too large to be handled by a small number of business firms, no matter how bold or ingenious their programs.

To put our colleges and universities back on a firm footing financially the help of the great rank and file of business corporations is required. All of them, large and small, have a crucial stake in seeing that this job is done. The future of America will be decisively shaped by what happens in and to our college classrooms.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: May 6, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF HYDRAULIC TURBINE GOVERNORS
SPECIFICATIONS NO. PA-4-15002

ST. LAWRENCE CONTRACT NO. P15
NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the manufacture and furnishing of Hydraulic Turbine Governors and delivery thereof f.o.b. destination, until 10:30 A.M. Eastern Daylight Saving Time on the 6th day of May, 1955 at the Authority's office, 270 Broadway, Hearing Room C, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for eight twin-actuator type governors and appurtenances for the sixteen hydraulic turbines for the Barnhart Island Power Plant in accordance with the bidding schedule. Erection at the site of installation will be done by others.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York after April 11, 1955 upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents, and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 26, 1955

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR
CONSTRUCTION OF
IROQUOIS DAM
NEAR POINT ROCKWAY,
ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATION NO. PA-5-11011

ST. LAWRENCE CONTRACT NO. 11
NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Iroquois Dam and appurtenant works near Point Rockway, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 11:00 A. M. Eastern Daylight Saving Time on the 26th day of May, 1955, in the Chamber of Commerce Building of the State of New York, 65 Liberty Street, in the "Great Hall" located on the 2nd floor, New York, New York.

(2) If mailed in until 10:30 A. M. Eastern Daylight Saving Time on the 26th day of May, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are:
Estimated:

214,000 cu. yds.	Excavation for Cofferdams
14,300 MFBM	Timber Cribs for Cofferdams
279,000 cu. yds.	Crib Fill for Cofferdams
2,900 tons	Steel Sheet Piling for Cofferdams
2,726,000 cu. yds.	Excavation, Common, Dry
39,000 cu. yds.	Excavation, Rock, Dry
1,240,000 cu. yds.	Excavation, Common, Wet
18,500 lin. ft.	Drill Holes for Exploration and Grouting
91,300 cu. yds.	Embankments and Protection Stone
161,620 cu. yds.	Concrete
8,526,000 lbs.	Structural Steel and Miscellaneous Metalwork
13,260,000 lbs.	Erection of Gates and Guides
1,300,000 lbs.	Erection of Gantry Cranes

The work shall be completed on or before February 28, 1958.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Fifty ($50.00) dollars per initial set and Twenty-five ($25.00) dollars per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid except that guarantee in excess of $2,000,000 will not be required.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 20, 1955

Middlesex County Sewerage Authority
New Brunswick, N. J.

NOTICE TO CONTRACTORS

Sealed bids for constructing the Outfall, under Contract number 12, will be received at the office of the Middlesex County Sewerage Authority, 103 Bayard Street, New Brunswick, N. J., until 2:00 P.M. Eastern Daylight Saving Time, on May 20th, 1955, and then will be publicly opened and read aloud.

Project includes about 10,700 feet of 84 inch Outfall sewer on land and 6,500 feet in Raritan Bay; 3,600 feet of 8 inch water main; 3,300 feet of access road and appurtenant work.

Drawings and contract documents may be examined at offices of the Authority and of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston 16, Mass. Copies may be obtained from the Authority only on payment of $25.00, and which amount will not be refunded.

Bid security: certified check to the order of the Middlesex County Sewerage Authority, or bid bond for $250,000. Successful bidder must furnish 100% performance bond.

MIDDLESEX COUNTY SEWERAGE AUTHORITY
By: Chester A. Lydecker, Chairman.

Bids: May 3, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF GENERATOR AIR CIRCUIT BREAKERS
SPECIFICATION NO. PA-4-14005

ST. LAWRENCE CONTRACT NO. P12
NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture, and furnishing of sixteen (16) generator air circuit breakers and appurtenances, and the delivery thereof f.o.b. destination, until 10:30 A.M. Eastern Standard Time on the 3rd day of May, 1955 at the Authority's office, 270 Broadway, hearing room "C" on the sixth floor, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for the generator air circuit breakers, appurtenances and services in accordance with the bidding schedule. Erection at the site of installation will be done by Others but services of an erecting engineer shall be provided by the manufacturer if and when required. Delivery will be required in groups of 4 air circuit breakers every six months starting September 1, 1957.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 24, 1955

Fort Pierce Port Authority

The Board of Commissioners of the Fort Pierce Port Authority requires the services of an engineering firm with special experience and qualifications to carry out the following work, looking toward the reactivation of an existing port facility:

1. Complete economic study, including traffic, rates, earnings, area benefits, and development of resources existing and projected.
2. Physical facilities existing and projected.
3. A recommended development plan, in stages, to reactivate port on a self-liquidating basis.

It is requested that interested engineering firms, whose normal practice has included similar economic development studies for other ports, submit brochures of their qualifications and record of performance in accordance with established codes of ethics of the recognized engineering societies. It is requested that such brochures be received by the Fort Pierce Port Authority not later than May 24, 1955.

Harry J. Kiciliter, Chairman
Fort Pierce Port Authority
Drawer 111
Fort Pierce, Florida

U. S. Government

Sealed bids will be received until 3:00 P.M. EST May 4, 1955 in Rm. 620 Post Office & Court House, Boston 9, Massachusetts, for lighting and painting improvements, etc., at the South Postal Annex, Dorchester Avenue, Boston, Massachusetts. Bidding material may be obtanied from General Services Administration, Rm. 620 Post Office & Court House, Boston 9, Massachusetts or Public Buildings Service, Rm. 1304 General Services Building, Washington 25, D. C., Executive 3-4900, Extn. 2397. P. A. Strobel, Commissioner of Public Buildings.

OFFICIAL PROPOSALS

Bids: May 5, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 5th day of May 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 353 Broadway, Albany, N. Y.						
Albany Greene Schenectady	C.T. 55-5 M.T. 55-3	New York State Thruway—Catskill Section—Subs. 3-3A-4-5-6-7 (Ulster-Greene Co. Line to Western Ave.) & Mohawk Section—Sub. 1 & 2 (Western Ave. to Schenectady-Montgomery Co. Line)	....	Furnish and Install 80,500 L.F. of Beam Type Guide Railing	$14,000 Plans $10	$255,000
Greene	C.T. 55-6	New York State Thruway—Catskill Section—Sub. 6 (Coxsackie Gas Station-Restaurant Site) Type B	....	Grading, Paving & Misc. Work	$9,000 Plans $10	167,000
Saratoga	FARC 55-8	Wait Corners-Lapes Corners, S.H. 1523 Lapes Corners-Clifton Park, S.H. 8137 Proj. S-202(2)	2.71	Asp. Conc., Opt.	$15,000 Plans $10	271,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Herkimer	M.T. 55-4	New York State Thruway—Mohawk Section—Sub. 10A (East Schuyler Gas Station-Restaurant Site) Type B	....	Grading, Paving & Misc. Work	$9,500 Plans $10	170,000
Herkimer	M.T. 55-5	New York State Thruway—Mohawk Section—Sub. 11A & 12A (Indian Castle Gas Station-Restaurant Site) Types A & C	....	Grading, Paving & Misc. Work	$30,000 Plans $10	545,000
Montgomery	M.T. 55-6	New York State Thruway—Mohawk Section—Sub. 15 (South Amsterdam Gas Station-Restaurant Site) Type B	....	Grading, Paving & Misc. Work	$21,000 Plans $10	378,000
Montgomery	R.C. 55-18 FARC 55-19	Fort Plain-Canajoharie—Canajoharie-Fultonville, Pt. 1, S.H. 8348 Canajoharie-Fultonville, Pt. 2, S.H. 8371 Canajoharie Village; Erie Blvd. and Main St. Pt. 2, S.H. 1866A Canajoharie Village: Erie Blvd. and MainSt., S.H. 1866 Proj. F-467(5)	5.79	Asp. Conc., Opt.	$23,000 Plans $10	399,000
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Bldg., Hornell, N. Y.						
Chemung	FARC 55-11	Big Flats-Fitch Bridge, S.H. 8411 Fitch Bridge-Elmira, S.H. 946 Proj. F-596(3)	6.25	Asp. Conc., Opt.	$40,000 Plans $15	722,000
Schuyler	FARC 55-12	Horseheads-Montour Falls, S.H. 5208 Montour Falls, S.H. 5160 Proj. F-479(13)	1.25	Asp. Conc., Opt.= 1.24 Mi. Misc. Work = 0.01 Mi.	$8,000 Plans $10	144,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Dusee St., Watertown, N. Y.						
Saint Lawrence	FARC 55-14	Richville-Dekalb, Pt. 2, S.H. 9236 Proj. F-428(6)	3.09	Asp. Conc., Opt.	$23,000 Plans $15	416,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Orange, Rockland, Ulster	C.T. 55-4	New York State Thruway—Catskill Section—Sub. 3-4-5-6 & 7 (Suffern to Kingston)	....	Furnish & Install 120,315 L.F. of Beam Type Guide Railing	$22,000 Plans $10	400,000
Putnam & Westchester	FARC 55-22	Peekskill-Fishkill Pts. 1 & 2, S.H. 5147-5387 Proj. F-394(13)	4.01	Asp. Conc., Opt.	$25,000 Plans $10	421,000
DISTRICT No. 9, F. W. Donovan, District Engineer, 71 Frederick Street, Binghamton 21F, N. Y.						
Broome & Chenango	FARC 55-16	Barker S.H. 375; Chenango Forks-North Fenton, S.H. 1241; Port Crane-North Fenton, S.H. 963; North Fenton-Belden Pt. 1, S.H. 9036; North Fenton-Belden, Pt. 2, S.H. 8427 Proj. S-440(1)	11.96	Asp. Conc., Opt	$35,000 Plans $15	623,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway at Lttle East Neck Rd., Babylon L. I., N. Y.						
Suffolk	FARC 55-24	Port Jefferson-Riverhead Pt. 1 S.H. 8094 Port Jefferson-Riverhead, Pt. 2B S.H. 8111 Proj. S-430(2)	6.13	Asp. Conc. Opt.= 605 Mi Misc. Work = 0.08 Mi.	$38,000 Plans $10	658,000
Suffolk	FARC 55-25	Mattituck-Greenport, Pts. 1 & 3 S.H. 8229 Proj. F-348(6)	1.91	Asp. Conc., Opt.	$22,000 Plans $15	403,000
Suffolk	FARC 55-26	Bayshore-Brookhaven Town Line, S.H. 5301, Proj. S-442(1)	0.28	Asp. Conc., Opt.= 0.26 Mi. Misc. Work = 0.02 Mi.	$6,000 Plans $10	103,000
Suffolk	FARC 55-27	Bridgehamton-Devon Pt. 2, S.H. 1524 Proj. F-559(9)	2.26	Asp. Conc., Opt.= 2.24 Mi. Misc. Work = 0.02 Mi.	$20,000 Plans $10	397,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

John W. Johnson
SUPT. OF PUBLIC WORKS

U. S. Government

INVITATION FOR BIDS (CONSTRUCTION CONTRACT). DATE, April 6, 1955. NAME AND LOCATION OF PROJECT: Project No. 6 on St. Thomas, Virgin Islands. As noted herein for Roadway. DEPARTMENT OR AGENCY, Government of the Virgin Islands. BY (Issuing office) Public Works Commissioner, Government of the Virgin Islands, Charlotte Amalie, St. Thomas, Virgin Islands. Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 3:00 p.m., Atlantic Standard Time, May 18, 1955, in the office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands, and then publicly opened. Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other contract documents are open for public inspection at the office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands; R. L. Kenan & Associates, Bell Building, Montgomery, Alabama; A.G.C. Office, 1113 Congress Building, Miami, Florida; Builders Exchange, 46 Northeast 6th Street, Miami, Florida; Urban Renewal Administration, 2nd Floor, del Valte Building, Santurce 17, Puerto Rico; and F. W. Dodge Corp., 119 West 40th Street, New York 18, N. Y. Plans and specifications may be procured from the office of R. L. Kenan & Associates at the Bell Building, Montgomery, Alabama, upon deposit of the following: Proposed Waterfront Roadway, $20.00. Deposit shall be only by certified check payable to R. L. Kenan & Associates which will be refunded to bona fide bidders upon the return of plans and specifications in good condition within forty-five (45) calendar days from the date of bid opening. A bona fide bidder includes any person who submits a bid for a general contract, but does not include a person who submits a quotation to the general contract bidders. To persons who procure plans and specifications upon payment of the above stated amount and who do not submit a bid, seventy-five (75) per cent of the deposit amount will be refunded upon the return thereof in good condition within forty-five (45) calendar days from the date of bid opening. No refund will be made for return after that time. After the bid opening additional copies of plans and specifications may be obtained from R. L. Kenan & Associates, at commercial rates, plus handling and mailing charges. Bonds, etc. Each bid must be accompanied by a satisfactory bid guaranty in an amount not less than 5 per cent of the total bid. The successful bidder will be required to furnish a performance bond and payment bond, each in the amount of 100 per cent of the contract price. No bid may be withdrawn until thirty (30) calendar days after the scheduled closing time for the receipt of bids. The Government of the Virgin Islands reserves the right to award a contract for any or all items of any bid, whichever course is in the best interests of the Government of the Virgin Islands. Description of work: The construction of a roadway approximately 7,830 feet long along the seawall in Charlotte Amalie Harbor which includes: 13,500 C. Y. Common Excavation, 4,700 C. Y. Solid Rock Excavation, 1,434 L. F. Culvert Pipe, 38 Ea. Roadway Inlets, 12,900 L. F. Standard Combination Curb and Gutter, 280 C. Y. Rubble Masonry Curb Wall, 2,460 S. Y. Grouted Riprap, 6,330 S. Y. Concrete Sidewalk, 25,700 S. Y. Dry Macadam Base Course, 25,700 S. Y. 2 inch Bituminous Surface, 4 Ea. Comfort Stations (toilets), Roadway Lighting System. With Alternates: 25,700 S. Y. Stabilizing Subgrade, 25,700 S. Y. Concrete Paving.

OFFICIAL PROPOSALS

Bids: May 3, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 44(1927) U.S.130(1953), SECS. 15-F & 16-D PLANTING

Route 44 (1927) U. S. 130 (1953), Sections 15-F and 16-D, from Berkley Road to Route U. S. 322, Planting; Greenwich, East Greenwich and Logan Townships, Gloucester County. Length 6.036 miles. The principal items of work are:

Estimated: 477 Trees—Deciduous
178 Trees—Evergreen
612 Trees—Small & Flowering
3,620 Shrubs
475 Vines
590 cu. yds. Topsoil

Bids for the above will be received at the office of the State Highway Department in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, May 3, 1955, at NINE o'clock (9:00 A.M.-EASTERN STANDARD TIME), TEN o'clock (10.00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and sealed special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPT.,
A. Lee Grover, Chief Clerk

Bids: May 19, 1955

Bid for Sewerage System and Sewage Pumping Station

ADVERTISEMENT
Notice to Contractors

Notice is hereby given that sealed bids or proposals, inclosed in sealed plain wrapper, bearing the appropriate identification "bid for sewerage system and sewage pumping station", will be received by the Town Clerk at the office of the Town Board, Town of East Greenbush, N. Y. at 8:00 P.M. Eastern Daylight Saving Time on the 19th day of May, 1955 and then will be publicly opened and read aloud at the meeting of the Town Board to be held at such time and place.

Copies of the plans and specifications may be examined at the office of the Town Clerk of the Town of East Greenbush, N. Y., Columbia Turnpike East Greenbush, N. Y., or at the office of the engineers, Benjamin L. Smith and Associates, 11 North Pearl Street, Albany, N. Y.; copies thereof may be obtained from the Board and/or engineers upon payment of twenty dollars ($20.00) for each set of plans and specifications.

Proposals must be submitted on the blank form provided and in a manner designated therein. Each proposal must be accompanied by a bid bond or certified check in an amount equal to five percent (5%) of the total bid. The bid bonds or certified checks of all but the three lowest bidders will be returned within three days after the opening of bids, while the remaining bonds or checks will be returned as soon as the contract has been executed. The bid bond or certified check of the successful bidder will be retained to pay any loss or damage to the General Sewer District and/or the town of East Greenbush in the event said successful bidder shall refuse or neglect to enter into a contract in accordance with his proposal. Acceptance of the bid will be contingent upon the fulfillment of this requirement by each bidder.

The Town Board reserves the right to consider bids for a period of forty-five (45) days after their opening, and the right is reserved to reject all bids.

Town Board
Town of East Greenbush
(On behalf of General Sewer District by Grace F. Spierre, Town Clerk)

U. S. Government

INVITATION FOR BIDS (CONSTRUCTION CONTRACT). DATE, April 6, 1955. NAME AND LOCATION OF PROJECT, Project No. 21 on St. Croix, Virgin Islands. As noted herein for each school. DEPARTMENT OR AGENCY, Government of the Virgin Islands. BY (Issuing office) Public Works Commission, Government of the Virgin Islands, Charlotte Amalie, St. Thomas, Virgin Islands. Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 3:00 p.m., Atlantic Standard Time in the office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands, and then publicly opened. Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other contract documents are open for public inspection at the office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands; M. A. Dyer Company, 24 School Street, Boston, Massachusetts; A.G.C. Office, 1113 Congress Building, Miami, Florida; Builders Exchange, 46 Northeast 6th Street, Miami, Florida; Urban Renewal Administration, 2nd Floor, del Valte Building, Santurce 17, Puerto Rico; and F. W. Dodge Corp., 119 West 40th Street, New York 18, N. Y. Plans and specifications may be procured from the office of M. A. Dyer Company (Architects-Engineers) at 24 School Street, Boston, Massachusetts, upon deposit of the following: Frederiksted Elementary Junior High School, $50.00; Kings Hill Elementary School, $50.00; Both Schools together, $75.00. Deposit shall be only by certified check payable to M. A. Dyer Company which will be refunded to bona fide bidders upon the return of plans and specifications in good condition within forty-five (45) calendar days from the date of bid opening. A bona fide bidder includes any person who submits a bid for a general contract, but does not include a person who submits a quotation to the general contract bidders. To persons who procure plans and specifications upon payment of the above stated amounts and who do not submit a bid, seventy-five (75) per cent of the deposit amount will be refunded upon the return thereof in good condition within forty-five (45) calendar days from the date of bid opening. No refund will be made for return after that time. After the bid opening additional copies of plans and specifications may be obtained from the Architect-Engineer at commercial rates, plus handling and mailing charges. Bonds, etc. Each bid must be accompanied by a satisfactory bid guaranty in an amount not less than 5 per cent of the total bid. The successful bidder will be required to furnish a performance bond and payment bond, each in the amount of 100 per cent of the contract price. No bid may be withdrawn until thirty (30) calendar days after the scheduled closing time for the receipt of bids. The Government of the Virgin Islands reserves the right to award a contract for any one or both schools on the basis of the basic bid for each school or any combination of schools and/or sections or by the acceptance of any or all of the alternates, whichever course is in the best interests of the Government of the Virgin Islands. Description of work. The construction includes: St. Croix, Virgin Islands, Project No. 21—1. Frederiksted Elementary Junior High School. 2. Kings Hill Elementary School.

Bids: May 12, 1955

Contract No. P-6

DELAWARE RIVER PORT AUTHORITY
Administration Building
Camden, New Jersey

ROADWAY GRADING AND DRAINAGE, SEPARATION STRUCTURES AND CITY STREET CHANGES, MOYAMENSING AVENUE TO 7th STREET, and RANDOLPH STREET STRUCTURE

Sealed bids will be received for ROADWAY GRADING AND DRAINAGE, SEPARATION STRUCTURES AND CITY STREET CHANGES, MOYAMENSING AVENUE TO 7TH STREET, and RANDOLPH STREET STRUCTURE of the Bridge over the Delaware River Connecting Packer Avenue, Philadelphia, Pennsylvania, and Gloucester, New Jersey known as Contract P-6, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. (Eastern Standard Time), Thursday, May 12, 1955 at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $200,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: June 3, 1955

Middlesex County Sewerage Authority
New Brunswick, N. J.

NOTICE TO CONTRACTORS

Sealed bids for constructing the Central Treatment Plant, consisting of 5 component contracts as listed below, will be received at the office of the Middlesex County Sewerage Authority, 103 Bayard Street, New Brunswick, N. J., until 2:00 P.M., Eastern Daylight Saving Time, on June 3rd, 1955, and then will be publicly opened and read aloud.

Contract No.	Contract Title
15	Central Treatment Plant—General
15A	Central Treatment Plant—Structural Steel and Miscellaneous Iron
15B	Central Treatment Plant—Plumbing, Gas Fitting, Process Piping, and Pumping
15C	Central Treatment Plant—Heating and Ventilating
15D	Central Treatment Plant—Electrical

Drawings and contract documents may be examined at the offices of the Authority and of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston 16, Mass. Copies may be obtained only from the Authority, on payment of the amount stated below, and which amount will not be refunded.

Bid security: certified check to the order of the Middlesex County Sewerage Authority, or bid bond in amount stated below. Successful bidder must furnish 100% performance bond.

Contract No.	Payment on drawings and documents	Bid security
15	$90	$100,000
15A	25	15,000
15B	55	50,000
15C	20	2,000
15D	50	15,000

MIDDLESEX COUNTY SEWERAGE AUTHORITY
By: Chester A. Lydecker,
Chairman.

OFFICIAL PROPOSALS

Bids: May 3, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

RIDGEDALE AVENUE—FAS PROJECT S-104(2)

Construction of Ridgedale Avenue from State Highway Route 10 to Swinefield Bridge, in East Hanover Township, Morris County, New Jersey, Federal Aid Secondary Project No. S-104(2). Length 3.638 miles. The principal items of construction are:

Estimated:

30,000 cu. yds. Roadway Excavation
56,940 sq. yds. 5" Macadam Base Course
64,460 sq. yds. 3" Mod. Pen. Macadam
172,913 gals. Bituminous Material
6,887 tons Bituminous Concrete
4,194 lin. ft. Drainage
42 units Inlets and Manholes
8,157 lin. ft. Concrete Curb

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, May 3, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the "Required Provisions—Federal-Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set of plans and supplementary specifications upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10% of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and sealed special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPT.,
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS

Bids: May 3, 1955

State of New Jersey
State Highway Department
Trenton

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

NEW DURHAM ROAD-FAS PROJECT S-192(2)

Construction of New Durham Road from Dismal Road to Middlesex Avenue, Edison Township and Borough of Metuchen, Middlesex County, New Jersey, Federal Aid Secondary Project No. S-192(2). Length 1.553 miles. The principal items of construction are:

Estimated:

9,350 cu. yds. Roadway Excavation
29,900 sq. yds. 5" Macadam Base Course
29,313 sq. yds. 3" Mod. Pen. Macadam
61,560 gals. Bituminous Binder
4,010 tons Bituminous Concrete
2,278 lin. ft. Drainage
19 units Drop Inlets
5,960 lin. ft. Concrete Curb

Bids for the above will be received at the office of the State Highway Department, in the CAFETERIA, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, May 3, 1955, at NINE o'clock (9:00 A.M.—EASTERN STANDARD TIME), TEN o'clock (10:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P. L. 769, 81st Congress, and is to be performed in accordance with the "Required Provisions—Federal-Aid Contracts" of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans and supplementary specifications will be furnished upon payment of a fee of FIFTEEN DOLLARS ($15.00) for each set upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., with a check drawn to the order of the State Highway Department. A charge of $5.00 will be made for supplementary specifications unaccompanied by construction plans. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and sealed special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: STATE HIGHWAY DEPT.,
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS enable you to get the greatest variety of bids —and so to get the lowest prices consistent with the best work.

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for work on
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Give complete information including experience, education, and salary desired.

We desire only applicants who want long range employment.

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Please give detailed personal and experience record, three competent references and salary expected in first letter.

Hazelet & Erdal, Consulting Engineers
COMMERCE BLDG.
LOUISVILLE, KENTUCKY

BRIDGE DESIGNERS and DRAFTSMEN

For Consulting Engineer's Office, Location Great Lakes region.
Pleasant working surroundings with opportunity for professional development and advancement.
In reply state age, education, experience and rate of pay desired.
P-6226, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

GUNITE ENGINEER for estimating and project coordination as assistant to President of Nationally known Gunite Company, Philadelphia area. P-6085, Engineering News-Record.

YOUNG AGGRESSIVE engineer with field experience in asphaltic concrete and Portland cement concrete paving, for estimating, extensive travel, remuneration commensurate with experience & ability. P-6109, Engineering News-Record.

WATER WORKS Sup't-Operator for growing Eastern Penna. Municipal Water Co. Under 40 years, practical and/or educational experience required. Excellent opportunity; security for the right man. Give full details. Write P-6110, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

INSTRUCTOR OR assistant professor with M.S. degree to teach Mechanics and Route Surveying. Salary for nine months $4,000, to $5,000, depending on qualifications. Location, Northern New York. P-6114, Engineering News-Record.

EXPERIENCED FIELD Superintendent for large multi-story commercial project. Good salary, permanent position. Send qualifications to personnel department, Construction Services, 701 Hardt Building, 1700 North Broad Street, Philadelphia, Pennsylvania.

WANTED, DRAFTSMAN; map, subdivision, plot plans, calculations; for small seashore engineering office. Top salary to qualified man. P-6129, Engineering News-Record.

EXPERIENCED STRUCTURAL Engineer. Steel Detailer with at least 10 years experience to check detail shop drawings and supervise six other detailers for fabricated structural and miscellaneous steel for buildings. Town of nine thousand, central Pennsylvania. Write detailed summary of education, experience and minimum salary expected. P-6139, Engineering News-Record.

BRIDGE DESIGNERS Wanted. Permanent location—5 day week—retirement. Reply stating experience, education, age. Wyoming Highway Department, Cheyenne, Wyoming.

DETAILERS—TWO experienced steel detailers for permanent position with established fabricator of industrial buildings. Submit small snapshot, sample drawing, if available, and full particulars including experience and salary expected. Islands Welding & Supply Co., P. O. Box 94, Honolulu 10, Hawaii.

ASSISTANT ENGINEERS: Wanted by the City of Ann Arbor, Michigan population 55,009, two graduate civil engineers with experience in Municipal engineering. One engineer with experience in sewer and pavement design. One engineer with experience in street maintenance for street superintendent and supervisor of municipal garage. Retirement plan, sick leave, blue cross, medical, surgical and hospitalization insurance, group life insurance and paid vacation of two weeks after first year, three weeks after fifteen years. Salary $5,000 to $6,000. Apply to City Engineer, City Hall, Ann Arbor, Michigan.

ROAD, SEWER foreman, old line firm, Florida employment. Ability to handle small jobs. Submit qualifications, salary desired. P-6241, Engineering News-Record.

WANTED LAND surveyors, civil engineers and field crew chiefs—capable of performing office and field calculations. Opportunities for qualified persons. Varied types of large projects under contract. Non-experienced personnel need not apply. Walter J. Lehner & Sons 204 Lawyers Building Mount Clemens, Michigan (Our 43rd year).

CHIEF JOB office engineer with extensive experience in heavy construction. No surveying or field layout work involved. 2 civil engineers with 4-5 years experience in heavy construction to assist the chief job engineer with quantity take-offs, form design and drafting, etc. 1 cost engineer to supply field information required by the cost department. 1 cost department quantity take-off man on heavy construction. Reply to P. O. Box 82 Aurora, Minnesota with complete resume of education, experience and salary expected.

WANTED: GENERAL superintendent for midwestern building construction organization. Age between 35 and 50. A good opportunity with salary and bonus for qualified man. Submit complete resume and required salary. P-6199, Engineering News-Record.

JOB ENGINEERS
MECHANICAL OR CHEMICAL
SAN FRANCISCO
assignment

Recent design experience on petroleum refineries or chemical plants. Assignment requiries thorough knowledge of heat exchangers, pumps, piping layouts, specification work, and analysis of bids. Compensation commensurate with ability. Please write furnishing complete chronological experience record and salary history, also full details regarding education, salary required, business and character references.

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Experienced technician and administrator in one or more fields of concrete, steel, lumber, Bituminous Materials, Soils, Aggregates, Paints and general building materials. Inspection and control work. Degree required. Professional license preferred.

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Ch. E., M.E., or G.E., possessing broad background general materials; Corrosion studies and determination of properties.

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CIVIL ENGINEERS
Overseas Positions

Engineers with extensive highway experience in all phases of design and also construction supervision required for highly responsible overseas positions. Near East location. Attractive salary. Send completely detailed resume of experience and references.

P-6119, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

EXECUTIVE HIGHWAY ENGINEER

For foreign assignment. Must have extensive experience in top responsible capacity for initiating and directing large scale traffic studies and requirements. Experience record must, also, show complete responsibility for investigating requirements of drainage, types of pavement, soil stabilization, bridge structures and construction materials.

P-6222, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

OLD, ESTABLISHED, rapidly expanding company in northern New Jersey has opening for engineer, experienced in surveying, drafting, plant design and other phases of engineering in connection with crushed stone, sand and gravel operations. Excellent opportunity. Write, giving resume of education, experience and salary requirements to P-6218, Engineering News-Record.

INDIANAPOLIS STRUCTURAL steel fabricator has position open in engineering department for an estimator and a checker. Applicants should have experience in shop detailing. College background desirable, but not essential. Apply P-6211, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT thoroughly experienced in field supervision of industrial and institutional buildings. A good opportunity with a substantial firm. Give full information covering education, experience, references, age, availability and salary in letter of application. Location South. P-6213, Engineering News-Record.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

Additional Employment Advertising on page 176

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Degree plus minimum 6 years design exp; industrial exp. not acceptable.

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LAB ENGINEERS:
Degree plus min. 4 yrs on soils, concrete or asphalt.

CHIEF INSPECTORS:
Degree plus min. 6 yrs construction inspecting or min. 10 yrs. Construction inspection without degree.

SR INSPECTORS:
Degree plus min. 3 yrs construction inspecting, or min. 6 yrs construction inspecting without degree.

CHIEF DRAFTSMEN:
Degree plus min. 6 yrs construction drafting; industrial exp not accept.

SR DRAFTSMEN:
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P-6181, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Graduate Chemical, Mechanical, and Electrical Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of project and process engineering. Write giving full particulars regarding personal history and work experience. Please include telephone number.

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Reputable engineer with offices in Virginia desires connection with mechanical contracting or consulting engineering firm as manager of branch office. Will relocate if necessary but prefer east or southeast. 15 years experience in contracting, bidding, negotiation, purchasing, contract execution. 15 years in engineering and design. Positions of heavy responsibility. Supervision of up to 100 engineers and 1000 field workers. Air Conditioning—Heating—Plumbing—Utilities—Industrial Piping—Etc.

PW-6195, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

CONSTRUCTION ENGR.—BSCE, age 28, married 3 yrs experience heavy construction; highway, bridges, and field survey. Desires position with contractor on foreign project. PW-6028, Engineering News-Record.

CONSTRUCTION EXECUTIVE, available as project manager, on large operation, chief estimator for large organization or in other executive position where scope warrants employment of top man, thoroughly experienced on all types of construction and in every phase of general contracting. PW-5956, Engineering News-Record.

COST AND Office Engineer (27) six years industrial construction wants chance to help contractor save time and money. PW-5238, Engineering News-Record.

ADMINISTRATIVE ENGINEER, P.E., water supply, chemical, hydroelectric and industrial plants. Structural, hydraulic mechanical and related problems. Past affiliations consulting and industrial firms. Make your job easier by making mine tougher. Available April. Will relocate. Thirty years experience at your disposal. PW-6008, Engineering News-Record.

CONSTRUCTION SUPT. 25 years experience in industrial and commercial building. Prefer work in East. PW-6123, Engineering News-Record.

CIVIL ENGINEER, P.E., 31, 3 years design, 6 years construction experience. Desires responsible position NYC or vicinity. Salary $8500. PW-6160, Engineering News-Record.

CARPENTER FOREMAN—25 years experience in construction—various types. Read plans. Practical engineer. Can handle men. N Y City & vicinity. PW-5989, Engineering News-Record.

CONSTRUCTION ENGINEER, 28, BSCE, one year experience as structural detailer, four years in field on structural erection, and construction. Have worked on road, bridges, buildings, and a Hydro-Electric project. Desire responsible and challenging position. PW-6173, Engineering News-Record.

CONSTRUCTION MANAGER — age 47 — wide experience in grading, paving, sewer lines, and water lines—experience estimator in grading and paving—cost management and subcontract negotiations. PW-6165, Engineering News-Record.

SALESMAN OR factory representative—wide experience in construction materials and equipment. PW-6166, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT and engineer desires work in New England. Experienced industrial plants, housing, heavy construction, bridge and marine work, skilled estimator. PW-6168, Engineering News-Record.

MECHANICAL INSPECTOR thirty years installation and supervision in heating, plumbing, process piping and air conditioning. PW-6231, Engineering News-Record.

MS in ME—12 Yrs pilot, former naval aviator desires position as engineer and pilot. Will furnish airplane for challenging opportunity as factory rep, sales rep or executive assistant. PW-6209, Engineering News-Record.

GRADUATE ENGINEER 28, 4 years varied experience in construction industry, desires office-field position with contracting firm. PW-6235, Engineering News-Record.

CIVIL ENGINEER—5 years diversified experience with contractors and engineers in field and office on industrial buildings of steel, reinf. and pre-cast concrete. Good knowledge of detailing, take-off, expediting and sub-contract work. Capable coordinator and liaison man between owner, architect-engineer and subs. Desire permanent location in Rocky Mtn area or West Coast. PW-6186, Engineering News-Record.

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College House Offices HARVARD SQ. CAMBRIDGE MASS

POSITIONS WANTED

CIVIL—STRUCTURAL engineer, PE & LS. Sixteen years experience in heavy industrial and commercial building design and construction, land and airport development. Can handle project design, supervision and administration. Age 39. Wish to relocate in southwest or west. PW-6203, Engineering News-Record.

CONSTRUCTION MANAGER. Industrial constr. exper. multi-project field supervision. Civil engr. available soon. Anywhere USA. 6430 Lemon Avenue, Long Beach 5, Calif.

CONSTRUCTION ACCOUNTANT, office manager, both field and home, thoroughly experienced all phases, ten years experience, currently with large sand & rock & ready mix plant southwest. Prefer foreign assignment. PW-6219, Engineering News-Record.

PROJECT SUPERVISOR — Manager — general superintendent. Chemical process packaging plants. U.S. and foreign. Knowledge projects in toto flow sheets to production by progress through engineering and construction departments. Degree equivalent. 25 years experience. Residence N. Y. City. Will accept office, field, and foreign assignments. PW-6208, Engineering News-Record.

SPECIAL SERVICE

Appeals Service: Government Construction Contractors usually have questions of fact under dispute. I can be of service to you whether you have only one question or the entire processing of appeals. Your dispute is my business. SS-5062, Engineering News-Record.

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EARTHMOVING-CRUSHING-ASPHALT EQUIPMENT
DENVER, COLORADO — MONDAY, MAY 16, 8:30 A.M. (MST)

Sale will be held at the Monaghan yard at the Northeast part of Denver (Derby, Colo.). East 64th Ave & Kearney; Each-Piece-Positively-Sells-to-the-Highest-Bidder-Without-Any-Limit-Minimum-or-Reservation!!! A complete dispersion sale of the J.H.-N.M. Monaghan Construction Co; Write-Wire-Call auctioneers for sale bill!!!

FOURTEEN CAT D-8's, from 2U 21352 to 8R 7119, 2 are McCoy specials, most have dozers and DDPCU's; CAT D-4 w/Austin overshot loader, 751 hrs; LORAIN Model 820-K crane-drag, 2 yd machine new in August '53, Waukesha diesel; BUCYRUS-ERIE 54B shovel, S/N 50086, Buda diesel, completely overhauled, not used since; B-E 70' crane-drag boom; Hendrix buckets.

CEDAR RAPIDS Master crusher, a complete portable crushing plant, new in '52; PIONEER primary crusher; Cedar Rapids 50'x30" conveyor; Pioneer reciprocal feeder; PIONEER NUMBER 101 CENTRAL HOT MIX ASPHALT PLANT, complete plant, diesel power, used 2 seasons; Cummins diesel plant; asph storage tanks; B-G finisher; Etnyre distributor; B-G asph mixer; B-G bucket loader; other asph equipment; 2 Euclid motor scrapers, 14TD's Cummins diesel, 20 yd struck; 2 CAT DW-20's, complete; 7 CAT DW-10 tractors w/Cat bottom dump wagons; 3 LeT 'W' scrapers, single wheel; 3 Euclid 65FD rear end dumps; Euclid loader; Seven CAT No. 12 patrols from 8T 10834 to 7T 101, big tires; CAT elevating grader.

Eleven IHC 1953 210-11 heavy duty tandem dump trucks, excellent; Ten GMC '52 620 tandem dump trucks; 3 White tandem dump trucks; '49 Mack LJ 200 hp truck tractor; 21 other trucks and pickups; 3 tandem 8-10T rollers; 10T 3 wheel roller; G-D 686 and 445 cfm compressors; big float trailers and 11 other trailers; many many other items; Inspect the equipment at anytime!!

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WANTED
MANITOWOC Model 2000
Crane, *OR* Shovel or Backhoe
Either Gasoline *OR* Diesel
ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

PUBLIC AUCTION SALE
OF
CONSTRUCTION EQUIPMENT

SAM LANDAU, Auctioneer, will sell on

SATURDAY, APRIL 30, 1955 — AT 11 A.M.

ON THE PREMISES

U. S. ROUTE 46, WAYNE TOWNSHIP (PATERSON) N. J.
(BETWEEN CHICKEN BARN & RT. 23 CIRCLE—NEXT 2 GUYS FROM HARRISON)

Consisting of: LINK BELT SPEEDER ⅝ SHOVEL—LINK BELT SPEEDER CRANE (MODEL 120) (70' BOOM)—CATERPILLAR R-4 BULLDOZER—2 INTERNATIONAL TD-9 BULLDOZERS—ALLIS CHALMERS MODEL K BULLDOZER—LORAIN 75-B (Lorain 80 Shovel Front)—50' CRANE BOOM—BUCYRUS ERIE MODEL 16-B SHOVEL—LORAIN 10 WHEEL TRUCK CRANE—30' SELF PROPELLED CONVEYOR—¾-yd. CAMEL BACK HOE—BAY CITY ¾-yd. BACK HOE BUCKET—D-7 & D-8 ROLLERS—WISCONSIN GAS ENGINE 6 x 7 (Model E)—SET H.D.-14 CATS 55' (3 Sections) LORAIN TRUCK CRANE BOOM—AUTOCAR TRUCK WITH WINCH—OWENS ¾-yd. CLAM SHELL BUCKET—LORAIN BOOM (Bottom & Top Sections)—WILLIAMS ⅝ CLAM SHELL BUCKET—D-6 & D-8 CATERPILLAR IDLERS—LORAIN 40 CENTER DRIVE BOTTOM—H.D.-19 RADIATORS (Complete)—SET H.D.-19 CATS—BAY CITY SHOVEL FRONT MODEL 65 (Complete with Chain)—SET H.D.-8 CATS—CONCRETE MIXER (3-yds.)—2 INTERNATIONAL TD-9 DIESEL ENGINES—2 WAUKESHA MOTORS 4 x 4¾ (Model 6-K5 27-B) Complete with Clutch & Reduction Gear for Concrete Paver)—HOBART 300 AMP. WELDER—CHEVROLET PICK-UP TRUCK—SET H.D.-10 CATS (Complete with Idlers, Rolls & Sprockets)—TRUCK CRANE CHASSIS (Single Axle)—DOUBLE DRUM TRUCK WINCH—2 STEEL TANKS WITH STEAM COILS (3000 & 4000 Gals.)—30 TON STEEL BEAM & COLUMNS (24")—CABLES 150 LENGTHS WOOD BEAMS (5 x 10) (26' Long)—TACKLINE REEL DRAGLINE—CRANE EXTENSION BOOM CABLES—CLAM SHELL BUCKET TEETH—CHAINS—BLOCKS—SHIVS—PORK CHOP—BAY CITY ¾ SHOVEL TEETH—TOWING BAR—TRUCK TIRES—POWER PIPE THREADER—2 - 26" SHIVS FOR P & H CRANE—BULLDOZER BLADES—BLINKER LIGHTS—AUSTIN WESTERN ROAD MACHINE (Diesel Engine) (DT-118) (All Wheel Drive - 12 Wheel Steerer).

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Northwest shovels 1½ & 2½ yd.
Bucyrus-Erie shovels & draglines (1½ yd up to 9 yd)
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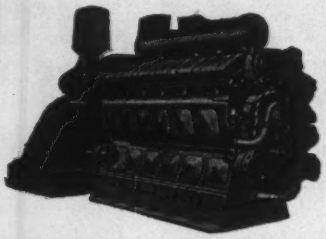

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1180	Worthington	SEH-8	1685	360	320	Superor	60E-6	460	450
1136	Fairbanks Morse	38D	1600	720	300	Fairbanks Morse	32E14	450	300
1100	General Motors	16-278A	1600	720	300	General Motors	8-268A	450	1200
1000	General Motors	16-567B	1440	720	250	Clark	GD-4	375	360
750	General Motors	12-567	1080	720	200	General Motors	8-268A	350	900
700	Worthington	EE-8	1000	327	175	General Motors	12-71	275	1800
675	Fairbanks Morse	38D	960	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	148	Fairbanks Morse	32E14	220	300
500	Alco	6-12 x13T	750	600	100	General Motors	3-268A	150	1200
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900 Ft. Link Belt 42 in Belt Conveyor.
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3½ yd Diesel Shovel (motor rebuilt)
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EN-510" Gas Engine
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10.00 x 22 Lug Tires
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Mack Tandem Bogie
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11.00 x 24 Lug Tires
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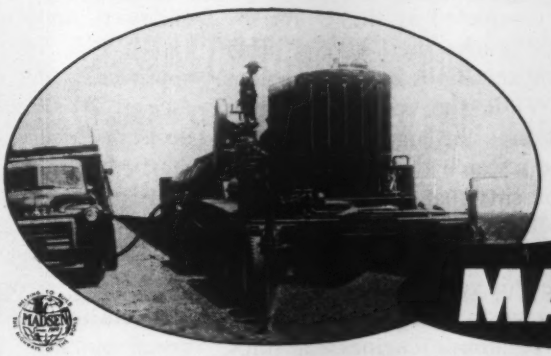

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EDITORIALS

Atom Work Generates Construction

THE SEVERAL NEW PROPOSALS for construction of facilities related to nuclear energy that have been made within the past few weeks, offer new evidence of the impact on construction that may be expected from further exploitation of the atom. The trend is worth noting.

The initial impact of this new industry occurred about a decade ago when the Atomic Energy Commission poured billions into new plants for refining uranium ore, producing fissionable fuel and manufacturing atomic bombs. New cities were built for plant personnel. And at about the same time, the AEC built several different types of nuclear reactors for research purposes. During this stage, annual expenditures for public industrial buildings set an all-time record.

As government spending reached its peak, the AEC opened the doors to private industry. First, radioisotopes were made available for medical and industrial applications. As a result there was new work for the construction industry, for in many cases, special heavily shielded rooms had to be built for storing these materials near the point of use. Next, the AEC permitted private universities to build and operate nuclear reactors for research, the first being completed at the University of North Carolina in 1953. Since then, several other universities and research organizations have taken steps to build test reactors. While the potential of new construction in this direction is not large, these reactors are significant because the research they make possible may lead to new developments that could have a far-reaching effect on construction.

In another direction, successful operation of a nuclear propelled submarine this year spurred interest in applications of nuclear energy to other means of transportation. Development of atomic engines for ships, aircraft and locomotives is now under way. While the first engines will be custom built, chances are that construction may start within a decade on new plants for producing atomic engines. In the meantime, opening up other new vistas for construction, contracts have been let for plants in which reactor parts will be manufactured.

Finally, and perhaps most significant, a congressional act last year, paved the way for private industry to develop and operate nuclear power plants. It resulted first in the AEC selecting the Duquesne Light Co to build and operate a $45 million plant at Shippingport, Pa. Now, within the past few weeks, several other private industry groups have applied to AEC for licenses to do likewise.

Thus, a new power industry is being launched, with prospects for rapid growth and giving utility experts good cause for predicting it will create at least $500 million in new construction business annually by 1965.

As experience is gained, it should be possible to cut costs of nuclear components substantially, especially by eliminating overdesign and by standardizing equipment to permit mass production. When that stage is reached, a boom may develop in nuclear industry construction rivaling even the rapid growth of the petrochemical and electronic industries.

Delayed Decisions Can Be Costly

PRESENT DIFFICULTIES IN LOS ANGELES—a predicament wherein new construction must be held in check until new sewage disposal capacity is provided—stem at least in part from delayed decision on a very basic question. Local issues, personal and political, surely have added confusion, but underlying all was the question of whether to continue treating sewage completely or begin dispersing it deeper into the ocean after less treatment. Los Angeles has decided to revamp its famed Hyperion plant from complete treatment of 245 mgd to primary treatment of greater daily volumes which will be dispersed farther offshore.

Now that the indecision has been cleared, consultants to Los Angeles will prepare plans for a $41 million reconstruction of Hyperion and its outfalls, while city engineers draw up $20 million worth of new sewers (ENR Feb. 24, p. 26). For this construction, voters approved a $60 million bond issue early this month (see p. 28). It is just unfortunate they did not have a decision three years ago on which to vote; the present drastic ban on building might have been avoided.

It is not our purpose here either to question or support the alternate plan decided upon, but only to point out how often choices must be made between differing engineering recommendations.

There is nothing wrong with divergence of professional opinion. Rarely is there a single answer to a complex engineering problem. And often, when there is divided engineering opinion, facts of the case quite aside from the engineering will decide it. The question that has bothered Los Angeles has had its counterparts: Upland sources or the Hudson River for New York City water supply; cement or asphalt for Ohio Turnpike pavement; big dams vs floodways for Kansas flood control.

The point to recognize is that working with the same facts from slightly differing premises or with varying estimates of the future, engineers can evolve differing recommendations. Recognizing this, forceful public officials and other molders of public thought can and should bring about judgment of the recommendations presented with reasonable haste. Thus can delays be avoided, with their costly and irrecoverable losses in both time and money, such as that which has brought Los Angeles to its present plight.

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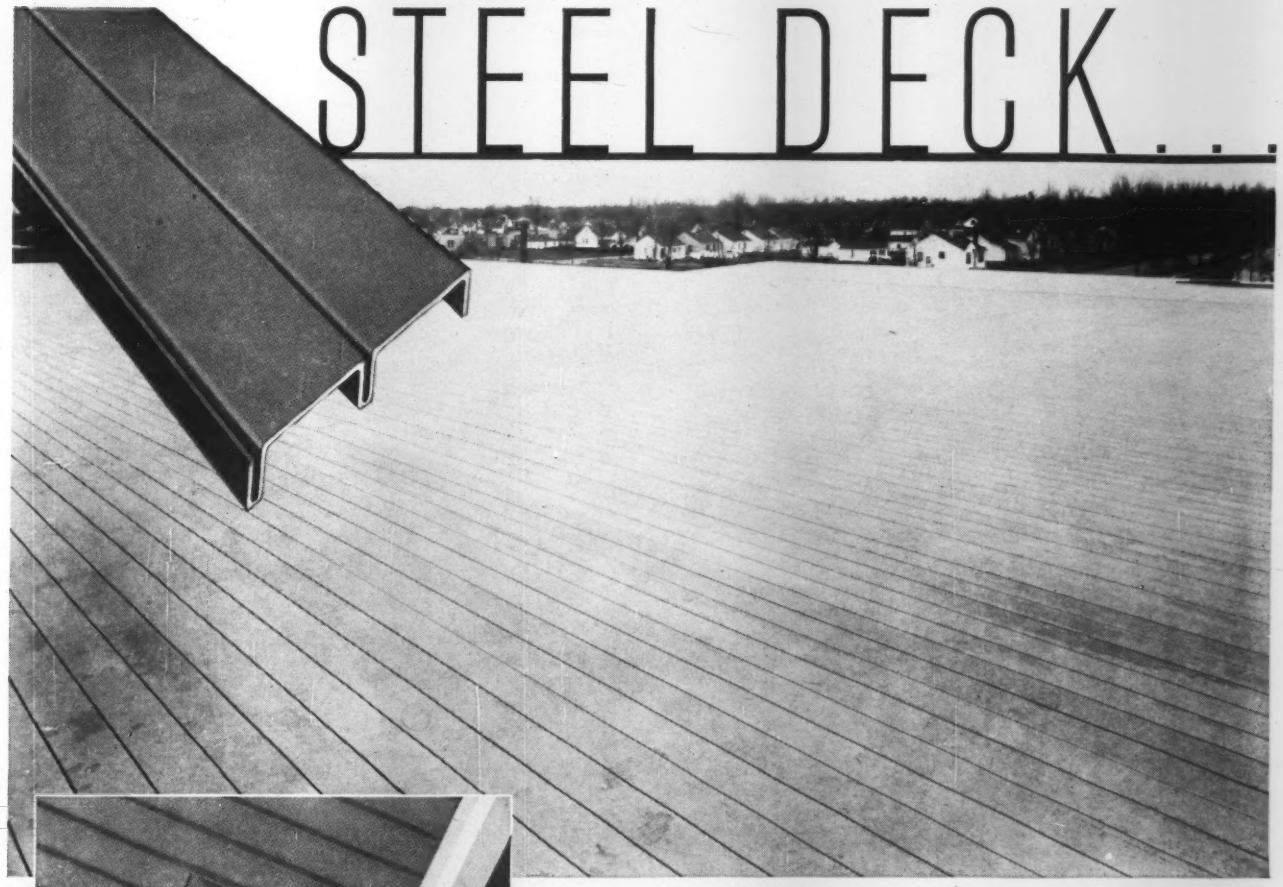
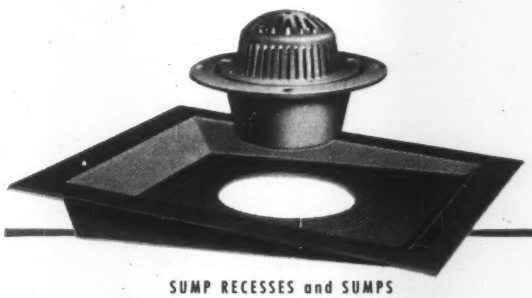


BUILT-UP SADDLES ELIMINATED

Built-up saddles are eliminated in Steel Deck Roofs. Purlins can be set to create valleys at sump locations in the drainage area. Steel Deck can be warped to conform. No additional deck plates are required—no cutting, fitting or bending necessary.



SUMP RECESSES and SUMPS

Mahon Roof Sump Recesses for use with Mahon Steel Deck can be furnished to fit any roof pitch. Mahon Cast Iron Sumps can also be furnished for 4", 5", and 6" conductors.

Most ECONOMICAL and Most LOGICAL Roof DECK MATERIAL available TODAY!

New steel deck roof construction methods and new type vapor seal adds to Steel Deck's many advantages. Now, more than ever before, Steel Deck stands out as the SAFEST and MOST PRACTICAL roof deck material available—why? . . . because it's STEEL, and because it is securely welded to the roof supporting structure. It's the most practical material to use because it's lightest in weight . . . and it's the most logical material to use because it costs less. Steel Deck's light weight, and the fact that it can be insulated to the exact degree to meet local requirements permits substantial savings in the supporting structure—total dead roof load will prove to be less than any other type in any given locality. Mahon Steel Deck is available in Galvanized or Enamel Coated Steel . . . stiffening ribs are vertical—no angular or horizontal surfaces where troublesome dust may accumulate. Mahon Enamel Coated Steel Deck has a bonded finish baked on at 350° F. prior to roll forming. See Sweet's Files for complete information including construction details and Specifications, or write for Catalog No. B-55-A.

THE R. C. MAHON COMPANY

Detroit 34, Michigan • Chicago 4, Illinois • Representatives in all Principal Cities

Manufacturers of Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms; Insulated Metal Walls of Aluminum, Stainless or Galvanized Steel; Insulated Metal Wall Panels; Rolling Steel Doors, Grilles, and Automatic Underwriters' Labeled Rolling Steel Fire Doors and Fire Shutters.

MAHON

Lowers the boom on maintenance costs with TIMKEN® bearings to take shock loads

TO help keep its newest, largest dragline—Model 1855—doing a rugged job with minimum time-out for maintenance and repairs, the Harnischfeger Corp. relies on 15 Timken® tapered roller bearings at vital points. Some of these applications are the intermediate swing shaft, digging and hoist drum shaft, bevel pinion shaft and fairlead.

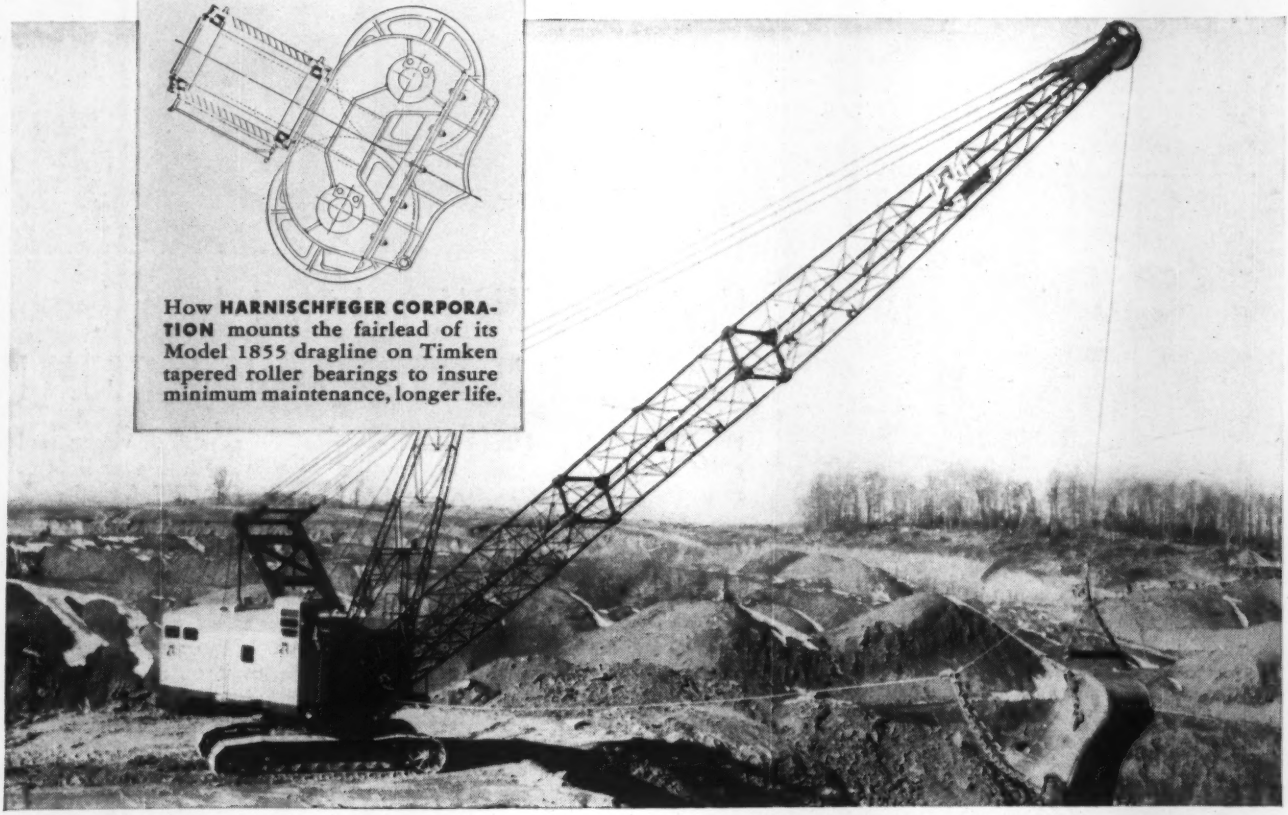
Imagine the shock loads put on the intermediate swing shaft when the cab, the boom and an 8 yard load of dirt being swung through the air are suddenly stopped and the direction reversed! Timken bearings take such shock loads with ease. That's because their rollers and races are case-carburized to give them tough, shock-resistant cores under hard wear-resistant surfaces.

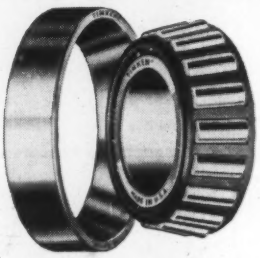
The Timken bearings on the digging and hoist drum shaft take the full weight of lifting and lowering the loaded bucket. Full line contact between rollers and races of Timken bearings gives them the extra load carrying capacity they need. And due to their tapered design, they carry both radial and thrust loads in any combination. Timken bearings take the thrust loads from the pinion gears and fairlead, insure accurate alignment. Gears mesh smoothly, last longer.

To get steel good enough for Timken bearings, we had to make our own. We're the only U. S. bearing maker that does. So always specify Timken bearings. They give longer life with less friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **HARNISCHFEGER CORPORATION** mounts the fairlead of its Model 1855 dragline on Timken tapered roller bearings to insure minimum maintenance, longer life.

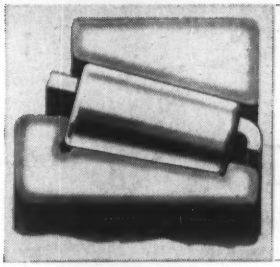




TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST → ⬭ ← LOADS OR ANY COMBINATION →✳←